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OUR TRANSPORTATION SERVICES

FOREWORD

The Canadian Citizenship Series pamphlets have been prepared for the use of all those persons who are interested in gaining a knowledge of our great country. They have been designed to present a factual picture of our geography, history, government, resources, and transportation services, and in so doing, to give some indication of how the Canadian nation has evolved.

None of the pamphlets in this series should be regarded as more than an introduction to the subject concerned. It is hoped, however, that this introduction may encourage the reader to pursue the subject more deeply, for an enlightened people is the keystone of our democratic way of life.

I should like to express to all who study this booklet my continued interest in their progress towards a better knowledge of Canada.

W. E. HARRIS,

Minister of Citizenship and Immigration.

ACKNOWLEDGMENT

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CHAPTER I

TRANSPORTATION BY WATER

From the dawn of history the rivers and lakes of Canada have played a vital role in the field of transportation. Long before the arrival of the first French explorers, the native Indians had developed the birch-bark canoe to a high state of efficiency and it was in widespread use as a means of transportation throughout most of the country. In some instances the Indians also used the dug-out, made by hollowing out a sound log, but it was neither as popular nor as universally used as the canoe.

The early settlers, faced on land with impenetrable forests, soon took to the water in travelling between settlements. They readily adopted the canoe to their own use and in time became almost as proficient in handling this frail craft as the Indians themselves.

The canoe was well suited to the needs of the pioneers. It was light in weight, durable and easy to make. In fact only a knife was required in order to construct a canoe. The Indian would strip the bark from a sound, smooth birch tree in the early summer when the sap made the bark pliable. Meanwhile the squaws were busy constructing the frame of the canoe from cedar strips. The bark was then sewn over the frame, with cedar fibres being used as thread, and the seams caulked with melted resin from the fir tree.

The smallest canoes could be carried in one hand yet they were capable of carrying two persons. The big war canoes on the other hand would carry twenty well-armed warriors and required at least four strong men to carry them. With the spread of the fur trade the canoe came to be a cargo craft. Some of the largest were 40 feet in length, 6 feet in breadth and 2 feet deep. Fifty men or five tons of freight could be carried in it.

The dug-out was used extensively by the Pacific Coast Indians. It was made of white pine, red or white cedar or tulip tree and averaged 20 feet in length. They carried good loads, handled easily and lasted ten to twelve years if kept well tarred or painted.

Far to the north, the native Eskimos had developed a water-craft known as the kayak which was in common use among the tribes for fishing, hunting and general travel among the Arctic islands and along the rugged shores. It differed from the Indian canoe in that it was built to accommodate only a single paddler who sat flat on the bottom. The frame was covered with skin instead of bark and the whole craft was decked in. Pointed at both ends and only wide enough to allow for its occupant, kayaks often reached a length of 15 feet. They were very swift and durable, but treacherous to handle for the uninitiated.

Such were the means of transportation in Canada in the early years of the 17th century when the struggling French colonies in Acadia and at Quebec sought to gain a foothold on this vast continent.

The distinction of building the first sailing ships in Canada goes to Pont-Gravé. Left behind at Port Royal by De Monts who returned to France for supplies, he and his associates began to fear that De Monts would not return. In order to effect their escape from this strange land, Pont-Gravé constructed two small vessels in 1606. Two years later he also built another ship at Tadoussac which he sailed to Quebec in time to assist in foiling a mutinous attempt on the life of Champlain.

For the most part, however, the early explorers and colonists were satisfied to use the canoe as a means of water transportation and only resorted to ship-building when it became absolutely necessary. In 1663 the Sovereign Council ordered the brigantine "Baliote" to be built at Quebec but it was not until Talon came to the colony as Intendant that ship-building took on the status of a thriving industry.

Soon after his arrival in 1665, Talon reported to Colbert in France that there was in the colony much wood suitable for the building of ships. This news was received with much satisfaction and the King despatched three carpenters to make a further report on the subject. Meanwhile, Talon himself undertook in 1668 to set an example for the other inhabitants by having a vessel of 120 tons constructed at his own expense. Another ship of similar size was also built under private auspices for use in the St. Lawrence fisheries.

By 1671 the art of ship-building at Quebec had progressed to the point that, in the budget for that year, Talon set aside 40,000 livres with which to build vessels for the King. They were to be constructed in local yards and sailed to France laden with ship-building materials to be used there for building additional ships.

Many of the ships built at Quebec under the direction of Talon were of considerable size. In 1672 a ship of 400 to 500 tons was under construction, while plans were being made for another of 800 tons. These efforts constituted a considerable achievement when it is observed that the majority of ships in the French Merchant Marine at this time were from 10 to 30 tons. In fact, there was only one ship built in France that exceeded 400 tons in 1680. The energy and skill of Talon brought about a rapid advance in ship-building and before he left Canada in 1672 he was able to write that there were 350 men engaged in building ships in a colony of less than 7,000 people.

At this time, however, the use of sailing ships was confined to the St. Lawrence and Acadian regions. Explorers and traders who ventured beyond the Lachine Rapids and up the Ottawa River continued to use the canoe on their journeys into the interior. The honour of introducing the sailing ship to the Great Lakes fell to the intrepid explorer La Salle. He became convinced that it was in the interests of both discovery and trade to have a vessel of some size on the upper Lakes. As a result, in the fall of 1678, he sent a party of men to the mouth of the Niagara River above the

Falls to build quarters, fell timber and prepare to construct a ship in the following spring. La Salle followed from Fort Frontenac early in 1679 with a 10 ton barge load of supplies and gear for the new vessel. He was wrecked near Queenston but managed to reach his destination with the necessary equipment to proceed with the project.

The keel of "Le Griffon", as the ship was called, was laid at the mouth of Cayuga Creek and the work progressed with considerable difficulty. The tools available were inadequate for the task, the timber was green and hard to shape while there was a constant threat from the Seneca Indians who looked upon the whole affair with great suspicion. At one stage, in fact, they attempted to burn the partially completed ship on the stocks. In spite of these hardships, "Le Griffon", a two-masted vessel of some 60 tons, was ready for launching in May 1679 and it slid into the waters of the Niagara River, while her cannons boomed and the builders shouted with pride.

It was promptly towed up the river to within three miles of Lake Erie where it was fitted with provisions and stores. On August 7, 1679, it set sail for the west and after passing through Lakes Erie, St. Clair and Huron, it arrived at Green Bay in Lake Michigan where it was loaded with a cargo of furs. La Salle remained behind to continue his work of exploration while "Le Griffon" set sail on the return journey to Niagara. Somewhere en route, tragedy struck at the little vessel for it was wrecked and there were no survivors to recount the story of the ill-fated voyage. Thus ended the first attempt of the white man to bring the wonders of the sailing ship to the Great Lakes.

Few ships appeared in the upper Lakes region for many years after the disappearance of "Le Griffon". Elsewhere the industry flourished however. A large frigate was completed in 1705 in Nova Scotia, while at Quebec many ships

were completed for the French King and for use in the West Indian trade. A bounty of 500 livres was offered by the King of France in 1731 for every ship built in the colony that was 200 tons or more. In the following year the amount set aside for this purpose reached 3,000 livres.

As a result of this stimulus, numerous ships were constructed in St. Lawrence shipyards for the King and the French Navy. One of the first of these was the transport and stores ship "Le Canada". It was launched in 1742 at a cost of 217,707 livres and was employed mainly in the trade with France and the West Indies. A number of warships were also built at this time. Among these were "Le Cariban", constructed entirely of white oak and costing over 300,000 livres to build and equip. "Le Castor" was 115 feet long, with a beam of 31 feet and carried 26 guns. "Le St. Laurent" and "L'Orignal" mounted 60 guns while the frigate "L'Algonkin" built in 1753 was sufficiently large to carry 72 guns.

Meanwhile the shipyards on the St. Charles River that had been established by Talon were found to be too small to cope with the heavy demand for ships and they were greatly enlarged in 1743. In that year, when some French merchants proposed to build a number of ships for use in the West Indian trade, there was some doubt expressed that there were enough carpenters to do the work without interfering with the building of the King's ships. As the size of the ships for the French Navy increased, the water of the St. Charles River was found to be too shallow opposite the shipyards. In 1745 this situation was met when a new shipyard was built at Cul-de-Sac, while a dry dock was also constructed about the same time opposite to the St. Charles shipyard.

Some dissatisfaction with the ships built in New France was expressed by the president of the Navy Board in 1752 with the result that no further ships were built for the French fleet. The King nevertheless continued to lend encourage-

ment to the building of merchant ships by private individuals. The period of great activity in the industry under the French however, was at an end, and it was not until the 1760's that ship-building again became an important factor in the economy of the colony.

Before 1775 there were only a few ships on the Great Lakes. Settlement was concentrated in Lower Canada and trappers penetrating the forest regions of the west preferred to make use of the canoe. However, an 80 ton schooner, the "Gladwyn" was built in 1763 and sailed extensively on Lakes Michigan and Huron. About the same time the "Beaver" made its appearance on Lake Erie, the first sailing ship on that lake since La Salle's "Griffon" nearly 100 years earlier. In 1764 the "Victory", the "Royal Charlotte" and the "Boston" were launched on the lower Lakes, while three years later the "Brunswick" made its appearance under the command of Captain Alexander Grant. The "Charity", a vessel of 70 tons, was one of the first ships on Lake Ontario in this period. An early issue of the Detroit "Tribune" indicated that there were four vessels on Lake Erie and the Detroit River in 1766. The ships were carrying troops, provisions and furs between Fort Erie and Detroit, the voyage requiring from six to nine days. All of these were of small tonnage however, and did little to advance water transportation beyond the stage of the canoe and paddle.

It was on the St. Lawrence that the major change was taking place. The French settlers had developed the bateau and much of the commerce and trade on the river was soon being carried in these sturdy little craft.

The bateau was a flat-bottomed boat, from 30 to 40 feet long and from 5 to 8 feet wide at the centre. The sides were nearly perpendicular and averaged about 4 feet in height. Both ends of the craft came to a sharp point that was curved up about a foot higher than the rest of the boat. The bateau was usually equipped with four or five benches for passengers and was able to carry a cargo of three to five tons.

It was nearly impossible to upset a bateau even in rough water, and as it was flat-bottomed it drew only 20 inches of water when loaded with 40 barrels of flour.

The bateau was usually equipped with a sail, but the lack of a keel and the rough rigging that was used, made it difficult to sail into the wind. The usual rate of travel in calm weather was about three miles per hour and a bateau seldom made more than thirty miles a day owing to the difficulties that were encountered along the route.

On the Ottawa River, larger bateaux were the rule, some of them being 75 feet in length, 12 feet wide and 5 feet deep. In many cases they were partly decked and were capable of carrying three tiers of flour barrels above deck.

The bateaux, or river boats as they were called, were of particular value during the latter half of the 18th century in carrying passengers and freight up the St. Lawrence River from Montreal to Kingston. In fact, the existence of numerous rapids made the flat-bottomed craft almost indispensable for the transport of heavy cargo into Upper Canada.

Goods were carried by road from Montreal to Lachine and there loaded on bateaux for the trip to Kingston. It was customary for a number of river boats to set out together so that the combined crews might be used in getting each boat up the rapids. When a rapid was encountered, the bateau was partially unloaded and the merchandise carted over a portage to a point above the rapid. Meanwhile the crew, aided by crewmen from other boats, towed their craft through the rough water. Two men were left on board to fend off rocks and keep the boat from running aground. It cost \$3.00 to \$3.50 to ship a barrel of rum from Lachine to Kingston and all other goods were charged on this scale with a barrel of rum as the standard of weight.

The American Revolution brought about numerous changes in water transportation on the Great Lakes. All ships on the Lakes were immediately pressed into the King's service and shipyards sprang into being at Detroit, Niagara

and Carleton Island near Kingston. These yards were to build armed vessels for use in patrolling the Lakes in search of "rebel" craft.

While civilian trade on the Lakes thus came to a standstill, little hardship resulted for instructions were promptly issued that the King's ships could carry freight, when convenient, in order to supply merchants and traders with goods. Regular shipping rates were charged and it is interesting to note that government vessels earned by this means some £9750 from 1777 to 1779.

While bateaux were supreme on the St. Lawrence as freight carriers during this period, they were soon displaced by schooners on the lower Lakes. After the American Revolution, a number of merchant ships were constructed for use on the Lakes. The sloop "Beaver" was launched at Detroit in 1785, while the "Otter" was built in the same year on Lake Superior. In 1786 two small schooners of 65 and 25 tons were launched at Detroit and in the following year the schooner "Lady Dorchester" of 100 tons was built near Kingston. Before 1793 the famous "Nancy" and another schooner had appeared on Lake Erie while two small sloops and two schooners were built on Lake Ontario. The biggest ship to appear on the lakes, the "Governor Simcoe" of 137 tons, was launched by a group of fur-trading companies on Lake Ontario in 1794.

The problem remained throughout this period of the movement of cargo from Lake Ontario to Lake Erie past Niagara Falls. A portage had been in existence since before the arrival of the white man, but it was rough and narrow. As traffic and the weight of cargo increased so did the need for better facilities at the portage. Before the American Revolution the road had run past the Falls on the east side of the river. After 1783 the British government began to construct a road on the west bank. By 1789 a group of fur-traders and merchants had established a service over the new portage. In 1790 a contract was given to this group for the transportation of all government stores for 1s 8d per 112

pounds. By 1797 there were as many as sixty wagons employed at one time on the road between Queenston and Chippawa. In spite of the rough roads, goods, canoes and even boats were dragged over the 11 mile route by horses and wagons. A major feat was accomplished about 1800 when a ship of about 75 tons was hauled over the portage.

Far to the west at Sault Ste. Marie, which lay on the Grand Portage route from Montreal to the western plains, another portage was necessary in order to gain entrance from the east to Lake Superior through British territory. A survey was made and in 1798 the North West Company cut a road and built a canal at the portage. The road was 45 feet wide, while the canal was more than 3,000 feet long and was equipped with one lock which raised the level of the water 9 feet. The lock itself was about 40 feet long and 8 or 9 feet wide.

Travel by water, however, had its disadvantages and even risks. In 1780 the ship "Ontario" was lost with all hands while the Government schooner "Speedy" went down on Lake Ontario in 1804 and 20 passengers and the crew were drowned.

West of Lake Superior the birch bark canoe continued to be the main method of travel. It was customary for the canoes to travel in "brigades" or large groups so that there was ample protection against unfriendly Indians and lots of manpower in getting canoes and later boats up the rapids.

The fur-traders generally put their faith in the canoe or boat with the traders from Montreal using the former almost entirely. In 1806, for example, the North West Company had 123 craft of which number 92 were canots du nord or middle-sized birch canoes, 17 were canots du maître or Montreal canoes some 35 to 40 feet in length and carrying a crew of 14 and a load of about two tons, while the remainder were boats.

The Hudson's Bay Company employed both canoes and boats in its extensive trading operations. There were, however, two major difficulties in the use of canoes—the white

men were largely dependent on the Indians for building the canoes, and few traders were skilled in handling the light craft after it had been built. Some of the officers of the Company became proficient in building canoes and in 1780 ten of them were constructed under the direction of Robert Langmoor, the chief factor of Hudson's House.

Because of the perpetual scarcity of canoes and expert paddlers, the Company made considerable use of boats, particularly on the main route from York Factory to Lake Winnipeg. Boats were also used on the Albany and Abitibi Rivers although the canoe remained the choice of most traders and explorers throughout the western regions.

Meanwhile far to the west, the first ship was launched in what was to become the province of British Columbia, when Captain John Meares constructed a 40 ton vessel at Nootka in 1786. Many years were to pass, however, before water transport was to develop on the rivers and in the coastal waters of the region.

The colonies of New Brunswick and Nova Scotia became famous as time passed for their ship-builders and sailors. In 1770 the schooner "Betsy" was launched at Saint John while another vessel of 300 tons was built in the colony in 1773. A brig was constructed at Halifax as early as 1751, while a ship of 250 tons was launched in 1786. It was not until the 19th century however, that the ship carpenters of the Maritime provinces reached the height of their fame as builders of fine sailing ships.

In the continued absence of merchant vessels on the Great Lakes, the King's ships carried most of the freight between Kingston, York and Queenston. The usual rate was 36s per ton, which, incidentally, was almost as much as ships charged to carry goods across the Atlantic. The charges were not unreasonable, however, when it is considered that ships were costly to build; sailors had to be brought up from the coast and retained on pay for five or six months of the year when

the harbours were frozen over. Ship carpenters were also difficult to find and many came up from the United States to work in the summer, and returned when winter came.

In 1791 the King's ships began to carry passengers as well as freight, the fare from Kingston to Queenston being two guineas including wines. When it is considered that the voyage might last a week in bad weather, this charge was not excessive. If a traveller was satisfied to go steerage, the cost was reduced to one guinea.

Accommodation on the early sailing ships was limited. Military officers and persons of consequence who travelled first-class were provided with cabins in the stern of the ship. There was however, considerable crowding since the cabins were small and each contained two or three bunks. There was little ventilation and poor light, while candles provided illumination at night. The bunks were without springs and the passengers were required to supply their own bedding. Those who could not afford the luxury of a cabin were required to shift for themselves. Many of them preferred to sit around on the decks, finding what shelter they could in case of bad weather. Food was also a problem, since steerage passengers had to begin the voyage with a sufficient amount of food to last them for the entire journey or do without. Delays owing to bad weather thus became a serious matter for many travellers.

Throughout this period sailing vessels were controlled either by the government or the fur-traders. The great majority of the ships were armed with cannons and could be classed as ships of war. There were however, three merchant ships on Lake Ontario in 1795. One of these, the "Kingston Packet", a vessel of 70 tons was advertised in that year as sailing between Kingston, Niagara and other ports on the Lake for the purpose of carrying passengers and freight. Nearly all of the traffic on the Lake was between Kingston and Queenston and few calls were ever made at other ports.

Lady Simcoe, in her diary, described a voyage from Kingston to Niagara in 1792, and cast some doubt upon the skill of the sailors who manned the lake ships. Sailing from Kingston July 23rd, 1792, the wife of the Governor wrote: "At eight this morning we went on board the 'Onondaga'—Commodore Beaton, the naval officer who has charge of the armed vessels on Lake Ontario. We sailed with a light wind The men who navigate the ships on this lake have little nautical knowledge, and never keep a log book. This afternoon we were near aground" In spite of this, the party completed the journey in two days without incident and on July 25th, Mrs. Simcoe was able to write: "I saw the spray of the Falls of Niagara rising like a cloud. It is 40 miles away."

The hazard of sailing the Lakes as observed by Mrs. Simcoe was also recognized by the Legislature of the province. In 1803 an Act was passed imposing a "lighthouse duty" of 3 shillings per ton on each vessel entering the ports of Kingston, York and Niagara. The funds so raised were to be used to construct and maintain lighthouses on Lake Ontario. During this period there were a number of fast-sailing schooners on Lake Ontario and excellent records were set. In 1795 for example, the sloop "Sophia" made the trip from Kingston to Niagara in 18 hours.

Meanwhile, the vast increase in settlement that took place in Upper and Lower Canada after the American Revolution put a heavy strain on shipping on the St. Lawrence and the lower Lakes. The increased demand for supplies and food-stuffs, coupled with the need for more shipping space for settlers' effects, brought about the need for bigger boats. As a result the Durham boat was introduced to Canada from the United States in 1809. At first these craft were manned entirely by Americans who had developed it on the Mohawk River. Later the crews were comprised of English-speaking Canadians.

The Durham boat was much larger than the bateau, and often reached a length of 80 to 90 feet. It was a flat-bottomed craft with a keel, rounded bow, square stern and a very large

rudder. The normal capacity was about ten times that of the early bateau. Downstream the Durham boat could carry 350 barrels of flour, or 35 tons, while the trip upstream could be successfully accomplished with a cargo of 8 or 9 tons.

Since this type of vessel was designed primarily as a freight-carrier, little attention was paid to accommodation for either passengers or crew. In fact, sleeping quarters were established wherever a canvas covering could be put up, a favourite place being the forward deck. Only the captain had quarters that could reasonably be called a cabin. A small stove was set up on deck for the convenience of those travelling on the boat and was, in fact, the only concession to passengers.

The Durham boat was described by a contemporary writer as a "species of sloop having one rather tall mast with a curiously-devised joint about four feet above the deck so that the mast could be lowered at any time". This device was most useful in passing under bridges without having to dismantle the entire mast or displace the cargo. There was a large hatchway extending over the centre half of the vessel, while the deck extended on both sides of the hatchway towards the bow and stern.

When the weather or currents prevented the use of sails, the Durham boats were "poled" upstream by the crew which numbered from five to ten men. The boats usually travelled in "brigades" so that ready assistance was at hand if any vessel got into difficulties. At some points along the St. Lawrence where the rapids were strong, horses were used to tow the boats upstream and farmers living in the district enjoyed a flourishing business, earning as much as \$4 to \$5 a day with their horses in this manner.

It was apparent, however, at a very early date that "poling" or "towing" vessels through the rapids was a most unsatisfactory means of overcoming such obstacles. The French had constructed small locks for bateaux at the Cascades, the Coteau and the Long Sault rapids on the St. Lawrence, but they extended only past the worst part of

the rapids in each case. The first bateau lock was cut through the limestone at Coteau du Lac in 1780-81. It was not until 1824 that the first canal was built on the St. Lawrence at Lachine, although the French had begun such a project as early as 1700.

The cost of freighting supplies up the St. Lawrence from Lachine by Durham boat was quite heavy. Charges for towing, transporting cargo by land and wages for one ship-load of eight tons totalled about \$125. Crewmen were paid 3s 6d per day during the trip, which lasted as a rule about twelve days. Foodstuffs such as flour, pork, salt and peas made up a large part of the cargo being shipped up the St. Lawrence. Potash and rum were also important items of commerce between ports, while furs continued to be the main cargo for ships descending the river from the Great Lakes.

Events were transpiring, however, that were to change the picture of transportation by water almost beyond recognition. In 1787 John Fitch, an American inventor, launched a boat on the Delaware River that was propelled by a steam engine. This event was eventually to seal the doom of the picturesque sailing ship, although it was many years before the schooner was to pass forever from the Canadian scene. In fact as late as 1889 there were still thousands of sailing ships on the St. Lawrence and the Great Lakes.

In 1809 the first steamboat in Canada, the "Accommodation", was launched at Montreal by the Honourable John Molson, who had associated with him David Bruce, a ship-builder and John Jackson, an engineer. The vessel was 85 feet long with a beam of 16 feet. The engine was of six horsepower which gave her an average speed of five miles per hour. A strong current, however, made it necessary to tow the vessel with horses along the shore since the engine was too weak to overcome the swift water. On her first trip from Montreal to Quebec, the "Accommodation" required three days. The actual running time, however, was 36 hours, since the lack of buoys on the river plus the inexperience of the pilots made it necessary to anchor at night. Fitted up

to accommodate 20 passengers, it is interesting to note that only 10 hardy souls ventured to make the journey on her maiden voyage. The fare from Montreal to Quebec was \$8, while the charge from Quebec to Montreal was \$10 including meals and berth.

The weakness of the engine, however, was the major difficulty to be overcome. Molson set about this task with enthusiasm. He went to England and placed an order with Boulton and Watt of Birmingham for a more powerful engine, designed to fit into a bigger ship. In 1811 this new vessel, the "Swiftsure", was launched. She was a sturdy ship, 120 feet long, with a beam of 24 feet and fitted with a 28 horsepower engine—nearly five times as powerful as that of the "Accommodation". So successful did this venture prove to be that Molson promptly set about adding to his fleet of steamers. By 1818 his firm, the St. Lawrence Steamboat Company, had launched the "Malsham", the "Car of Commerce" and the "Lady Sherbrooke". The "Lady Sherbrooke" was 170 feet long with a beam of 34 feet, and was equipped with a 63 horsepower side-lever engine.

By this time the steamers had improved their schedules as well for the Montreal-Quebec journey. In 1816 the steamboats made the trip in 24 hours, and the return trip upstream in about 36 hours. Accommodation for passengers had improved considerably and evidence of the popularity of the steamboat is found in the fact that in 1818 the "Car of Commerce" on one trip carried 1,380 settlers from Quebec to Montreal.

Much faith still remained in the sailing ship however. In 1814 the British launched two frigates, the "Princess Charlotte" and the "St. Lawrence" on Lake Ontario. The latter ship was 190 feet long and carried 102 guns which made it the largest and most powerful fresh-water warship ever built. These two vessels brought American control of Lake Ontario to an end at the close of the war of 1812-14.

At this time there were no vessels on the upper Lakes at all with the exception of two small craft owned by the North West Company—the “Mink” on Lake Huron and the “Perseverance” on Lake Superior; and the “Nancy”, a British schooner that had been converted into a ship of war.

Throughout these years the “Nancy” had the reputation of being one of the fastest and most dependable sailing ships on the Lakes. It made numerous trips from Fort Erie with cargoes destined for the Grand Portage at Fort William and in later years made similar voyages for the North West Company.

Meanwhile the steamboat was gradually making its presence felt outside the St. Lawrence region. In 1816 the “Frontenac,” the first steamer to be launched on Lake Ontario was constructed at Kingston. This vessel was considered to be the last word in steamboats. It was 720 tons with a deck that extended for 72 feet. It was propelled by paddle wheels that had a circumference of about 40 feet. The engines of 50 horsepower, were constructed in England by Boulton and Watt. The total cost of the “Frontenac” was nearly £27,000 of which amount some £7,000 was for the engines. Schooner-rigged and painted black, the ship presented a fine appearance for, as a contemporary writer put it, “her proportions strike the eye very agreeably”. Although the ship suffered a mishap on her maiden voyage and had to be pushed off a rock in the St. Lawrence above Prescott, it continued to perform yeoman service for a number of years including weekly trips from Prescott to York under the command of Captain James McKenzie. She finally came to grief in 1827 when arsonists set fire to the vessel at Niagara and then cut her adrift. By the time the fire was brought under control the “Frontenac” was beyond repair and was soon scrapped.

While the “Frontenac” was under construction near Kingston, another steamboat, the “Ontario”, was being built at Sackett’s Harbour in the United States. This vessel was

fitted up and set sail on her maiden voyage in April 1817, thus winning the honour by a narrow margin of being the first steamboat to navigate on Lake Ontario.

About the same time as the "Frontenac" and "Ontario" were being constructed at Lake Ontario shipyards, the steamboat made its appearance on the Saint John River in New Brunswick. On May 21st, 1816, the "General Smyth" made its first trip from Saint John to Fredericton. It was followed in 1825 by the "St. George" and a regular service was established on the river.

While these early ventures in the use of steamboats created considerable interest and public attention, the schooner continued to enjoy wide popularity. After the war of 1812-14, for example, the number of schooners in operation on Lake Ontario rose rapidly. In fact, in 1816, when the first steamer was launched, there were over sixty schooners engaged in carrying passengers and freight between the various lake ports. Many of them were employed in the grain, lumber and potash trades and so great was their use as freight carriers that they came to be known as "wooden wagons".

While the sailing ship continued to dominate the scene, the success of early steamboats led to the building of more of these craft. In 1818, the second steamer, the "Queen Charlotte", was launched at Kingston. It was built largely from materials left over from building the "Frontenac" and was much smaller in size. Upon completion, the vessel was placed in service between Prescott and the Bay of Quinte with numerous points of call along the way. It is perhaps not without significance that the stage-coach from Prescott to Kingston ceased to operate a short time after the "Queen Charlotte" began her trips.

The first steamboat to appear on Lake Erie was the "Walk-in-the-Water" which was launched by an American in 1818. This vessel made regular trips between Buffalo and Detroit. Since the steam whistle was not introduced for

many years, the ship was equipped with a four pound cannon on the forward deck, which was fired to give notice of her arrival or departure. The fare from Buffalo to Detroit was \$18 for a cabin and \$7 if the passenger went steerage.

The vast increase in the amount of shipping on the St. Lawrence River and the lower Lakes coupled with the increased size of vessels and the introduction of the steamboat made some action to overcome rapids a vital necessity. As indicated above, small canals had been constructed on the St. Lawrence by the French in order to overcome some of the main rapids. These were improved and enlarged as military works in 1804 by the Royal Engineers.

As long as the bateau was the only vessel to be accommodated the situation was met, at least in part. The introduction of the Durham boat, the schooner and finally the steamer, made further action necessary. In 1817, the government of Upper Canada advertised for tenders for the improvement of navigation between Lachine and Kingston via the Rideau River. In the same year, the first mention was made of a project to connect Lakes Erie and Ontario by the Welland Canal in a paper prepared by William Hamilton Merritt for Robert Gourlay. In 1818, a company was incorporated to build the Lachine Canal, while another came into existence in the following year to construct a canal at Chambly. In 1819, the first three locks on the Ottawa River to aid in overcoming the rapids on the twelve-mile section between Carillon and Grenville were begun by the British Government. While all of the projects were finally completed, many years were to pass before the difficulties encountered in navigating these important waters were overcome.

Steam navigation came to the Ottawa River in 1819 when the steamboat "Ottawa" sailed from Grenville to Hull. The ship was constructed at the head of the Long Sault rapids on the initiative of Philemon Wright, the founder of Hull. It was equipped with the first steam engine to be made in

Canada. In that year there were twelve steamboats operating in Canadian waters, the majority being on the St. Lawrence.

In 1822 a second steamer, the "Union", was constructed on the Ottawa at Hawkesbury. It was described by a contemporary writer as, "in construction and appearance crude, in speed slow, and in accommodations decidedly limited". The settlers living along the upper reaches of the river were most enthusiastic, however, since travel by water in the past had been confined to the canoe, the bateau and the timber rafts, that were floated downstream towards Quebec.

The rapid development of water transportation in the eastern part of Canada had an influence on events in the broad reaches of territory under the control of the Hudson's Bay Company. Throughout the years, the canoe had been the backbone of the transportation system for traders of the Company in the whole Northwest although considerable use was also made of the York or Sturgeonhead boat. The York boat was a modified version of the bateau although it was not flat-bottomed. The frame was hewn out of trees with a broad-axe, while the planks were sawed out with a whipsaw. Caulking was done with a mixture of spruce gum and grease. The York boat was capable of carrying a cargo of four or five tons of freight and a crew of from ten to twenty men. In time Fort Edmonton became the main centre for the construction and repair of York boats, since there was much suitable timber about the fort and skilled caulkers congregated there. In 1823, Sir George Simpson, Governor of the Hudson's Bay Company, found that the canoe was too expensive a means of transportation and ordered that York boats would now be used over all the main trade routes of the Company.

While in the West, advances were being made from the canoe to the York boat, an increasing amount of attention was being given to the steamboat on the St. Lawrence. In 1823, a group of Montreal men formed a joint stock company to build steam tow-boats for use in towing vessels up-river

from Quebec to Montreal. The "Hercules" was the first of such vessels to be launched, while the first ship to be towed up-river was the "Margaret" of Liverpool. Prior to this time sailing ships were required to wait for favourable winds in order to reach Montreal. This often involved days, and sometimes weeks of waiting at Quebec.

In 1823, there were seven steamboats running between Quebec and Montreal. Five of them were, in the eyes of a contemporary observer, nearly as long as a forty-gun frigate. The double row of sleeping berths on each side of the cabin, were considered to be the ultimate in luxurious travelling, while the fare of \$14.50 from Quebec to Montreal was regarded as reasonable when the splendid accommodation was considered. Competition soon reduced the fares and by 1829 deck passage could be had on these steamers for \$1.50.

At the same time, improvements were made in the shipping facilities available on the Ottawa River. In 1824 a fleet of Durham boats was established for the first time on the Ottawa River by Judge Macdonell, a former member of the North West Company. These vessels provided much-needed cargo space for the transportation of goods to the thriving lumber centres on the upper reaches of the river.

A major event in the history of transportation by water in Canada took place in 1824 when a company was formed under William Hamilton Merritt to undertake the construction of the Welland Canal. The first sod was turned on November 30th of that year, although it was not until 1829 that the first ships passed through from Lake Ontario to Lake Erie.

This opened an important period of canal building in Canada, and during the next few years many of the main canal systems were completed and put into operation. In 1825, the Lachine Canal on the St. Lawrence was opened to navigation. Begun in 1818, it was equipped with seven locks, and was designed to accommodate vessels with a draught of four and a half feet.

In 1826 the government of Nova Scotia undertook the construction of the Shubenecadie Canal to connect Halifax with the Bay of Fundy. The project was finally completed, but the development of railways largely destroyed its usefulness.

In the same year construction of the Rideau Canal connecting Kingston with Montreal via the Ottawa River was commenced. This was a military project since it was felt that traffic proceeding up the St. Lawrence to Kingston was too exposed to attack from the United States. Colonel By of the Royal Engineers was in charge of the work which was financed by the British government. The headquarters of Colonel By at the junction of the canal with the Ottawa River soon became a thriving settlement known as Bytown—later to become Ottawa, the capital of Canada.

Canadian steamboat navigation commenced on Lake Erie when the "Chippewa", a vessel of 100 tons, began to operate in 1825, after the opening of the Erie Canal. Later it was joined by the "Emerald" and the two steamers maintained a service between Chippawa and Buffalo.

After 1825 the number of ships on the upper Lakes increased rapidly until it finally exceeded the number to be found on Lake Ontario. This was due to the vast increase in settlement that occurred in those regions west of the Lakes followed by an important traffic in grain that soon developed as land came under cultivation. This movement of grain began in 1836 when the brig "John Keane" arrived at Buffalo with a cargo of 3,000 bushels of grain from Lake Michigan. By 1840 the regular movement of grain down the Lakes was well established and in 1843 the first grain elevator was built at Buffalo.

In the meantime, the first serious opposition to the Molson line of steamboats on the St. Lawrence began in 1826, when the firm of John Torrance and Company purchased the steamboat "Hercules" and placed her on the regular run from Quebec to Montreal as a tow-boat and passenger

steamer. The Company later purchased the "St. George", the "British American" and finally in 1837, the "Canada" which was 240 feet in length and said to be the largest and fastest steamer in North America. From this time, steamboat travel on the St. Lawrence was commonplace.

The builders of sailing ships were not unduly impressed by this activity among the steamboat companies. The schooner was still, in their eyes, the queen of the seas—and would remain so. In 1826, the "Columbus", a large ship of 4,000 tons was built on the Island of Orleans. The vessel was a four-master, 300 feet long, with a 50 foot beam and a 30 foot hold. This lumber ship excited great interest when it docked at London in England and the Duke of Cumberland, later William IV, with a great company of guests was entertained on board.

However, even in the Maritime Provinces, the home of famous sailing ships, the use of steamboats continued to increase. In 1827, the little steamer, the "St. John" was providing a ferry service across the Bay of Fundy from Saint John, New Brunswick to Annapolis and Digby in Nova Scotia. In 1829 the Dartmouth and Halifax ferryboat was converted to steam with an engine of 30 horsepower. Great difficulty was experienced, however, in getting it to work well. In the following year, a steamboat with a 30 horsepower engine plied between Pictou and New Glasgow, N.S.

Regular communication by steamboat between Prince Edward Island and the mainland was established in 1832 when the steamer "Pocahantas" made her maiden voyage. An excursion steamer, the side-wheeler "Richard Smith" was the first steamer to cross the Strait of Northumberland, however, when it carried a party of sightseers from Charlottetown to the mainland on August 5th, 1830. In 1832, a second steamer "Maid-of-the-Mist" began service between Saint John, N.B. and Windsor, N.S. By using the services provided by the "Maid-of-the-Mist" and the "St. John", it was now possible to cross the Bay of Fundy by steamer three times a week from Saint John—twice to Annapolis and once to Windsor.

A historic chain of events began at Quebec in 1831 when the "Royal William", a paddle-wheel steamer of 1,300 tons was built. For two years, the ship operated between Quebec and Halifax. In 1833, however, a much bolder feat was accomplished, when the "Royal William" crossed the Atlantic from Quebec to London using nothing but her steam engines for power. One or two other vessels had crossed the Atlantic using steam to assist their sails, but the "Royal William" was the first to cross the ocean entirely by steam power.

Meanwhile important events were occurring on the St. Lawrence and Great Lakes waterways. In 1829 the Welland Canal was completed, which allowed vessels to proceed from Lake Ontario into Lake Erie. The first ship to complete the passage through the canal was the "Annie and Jane" on November 30th, 1829.

The original canal extended from Port Dalhousie on Lake Ontario to the town of Port Robinson where it joined the Welland River. Ships proceeded thence to the Niagara River and finally into Lake Erie. This circuitous route was not satisfactory, however, and between 1831 and 1833 the canal was extended from Port Robinson to Port Colborne on Lake Erie. The original canal had 40 wooden locks, the smallest being 110 feet long and 22 feet wide with a depth of water of 8 feet. It was not long, however, before action was taken to enlarge and improve the canal.

A start was made in 1830 on the Chambly Canal which was designed to connect the St. Lawrence River with Lake Champlain. Work was commenced at St. Ours, but it was thirteen years before the project was finally completed. The canal was twelve miles in length and had a series of nine locks.

In 1832, the Rideau Canal was completed and opened for navigation. The first vessel to pass through the canal was the steamer "Pumper". In the same year a bateau lock was constructed at Vaudreuil at the junction of the Ottawa and St. Lawrence Rivers.

As settlement grew so did the number of vessels on the Great Lakes. Regular service by steamer between the important ports was established and travellers were assured

of connections for points in the United States and down-river to Montreal. In 1831, for example, the "Great Britain" driven by two ninety horsepower engines, was operating every fifth day from Niagara to Oswego, thence to Kingston, Brockville, Prescott, York and finally back to Niagara. Fare from Prescott to Niagara was £2 with correspondingly lower rates between intermediate points. A horse would be transported between the two points for £1 5s while a barrel of flour was conveyed for 1s 3d.

The numerous rapids continued to form a formidable barrier to navigation on the St. Lawrence River below Prescott. Attempts were made to offset the effects in part through the construction of more powerful steamers. In 1832 a stern-wheel steamboat, the "Iroquois" was built to overcome the rapids between the Long Sault and Prescott. Horses and oxen were still required, however, to tow the vessel up through the Rapide Plat. A more powerful boiler, coupled with improved navigation on the part of the crew, finally enabled the "Iroquois" to make the entire journey under her own steam and the portage routes were abandoned except for the one around the Long Sault above Cornwall.

The importance of passenger traffic was also becoming apparent, and keen competition developed in the construction of ships providing the last word in luxurious fittings. In 1833 the first cabins were constructed on deck, while thick carpets, massive paintings and mirrors, splendid meals and wines became the order of the day.

In 1834, there were ten steamers operating on Lake Ontario between the various Canadian and American ports. Regular schedules were maintained, so that persons travelling between the main centres almost invariably went by water. In fact, even the main stage-lines operated only in the winter when navigation was closed.

The opening of the Welland Canal in 1829 did much to stimulate the ship-building industry on Lake Erie. Notable among the ship-building centres was Port Burwell. Between 1834 and 1875 over 40 vessels were constructed at this port.

Some idea of the increased activity on Lake Erie is to be gained from an account of a visit to Buffalo in 1837 by Mrs. Anna Jameson. In her book she observes that "In the port I counted about fifty vessels, sloops, schooners and steam-boats". Most of the vessels were, however, American-owned for Mrs. Jameson continues, "We have [in 1837] on this lake two little ill-constructed steamers, which go puffing up and down like two little tea-kettles, in proportion to the gigantic American boats; and unfortunately, till our side of the lake is better peopled and cultivated, we have no want of them. When they are required, they will exist, as on Lake Ontario, where we have, I believe, eight or ten steamers".

Travel by steamboat on Lake St. Clair at this time left something to be desired. According to an account by Mrs. Jameson "... The boat was built to navigate the ports of Lake Huron from Penetanguishene, to Goderich and St. Joseph's Island, but there it utterly failed. It is a wretched little boat, dirty and ill contrived. The upper deck, to which I have fled from the close hot cabin, is an open platform, with no defence or railing around it, and I have here my establishment—a chair, a little table, with pencil and paper, and a great umbrella; a gust of wind or a pitch of the vessel would inevitably send me sliding overboard".

Meanwhile, the first steamer had made its appearance on the west coast. Built in England for the Hudson's Bay Company, the "Beaver" sailed around Cape Horn and arrived at Fort Vancouver in 1835. Her machinery was installed after her arrival at the fort and the ship immediately went into service up and down the north-west coast. It was finally wrecked at the entrance to Burrard Inlet in 1888.

Lines of steamships now began to appear on the Great Lakes following the lead of Molson and Torrance on the St. Lawrence. In 1837 a line of steamships was established under the direction of John Hamilton, which later became the Royal Mail Line of ships on the Lakes. Hamilton was the first to introduce iron ships to Canadian waters. Donald Bethune of Cobourg also established the Bethune Line and

in 1842 was granted the first contract for carrying mail from Dickinson's Landing on the St. Lawrence to Toronto. The route at that time was covered in 36 hours.

Travel up the St. Lawrence from Montreal to Kingston remained an arduous undertaking, however. Describing such a trip in 1839, Lord Sydenham, the Governor-General, remarked "The journey was bad enough; a portage to Lachine; then the steamboat to the Cascades, twenty-four miles further; then road again (if road it can be called) for sixteen miles; then steam to Prescott, forty miles; then road twelve miles; then by change of steamer into Lake Ontario to Kingston". The situation was soon to be remedied for after the union of the provinces in 1840, steps were promptly taken to overcome the swift waters of the river by the construction of the St. Lawrence canal system. The absence of canals proved to be no obstacle for Captain Hilliard, however, for in 1840 he took his ship "Ontario" down through the Lachine Rapids to Montreal, the first steamer to accomplish this feat.

While the schooner and the steamboat were in stern competition on the St. Lawrence and the Great Lakes, the canoe was still playing an important role in the vast regions of the north-west. In 1840 Robert Campbell became the first white man to enter the present Yukon territory. He reached the region by way of the Liard River, thence up its tributary the Frances. A short portage brought him to the Pelly River, which he descended in 1843 to its junction with the Yukon River.

In 1846, J. Bell also entered the Yukon using a different route. He went up the Peel River from the Mackenzie to Fort McPherson, then up the Rat River, portaged to the Bell River and finally reached the Porcupine.

While the canoe thus continued to satisfy the needs of the explorer and trader in remote regions, constant efforts were being made to improve the vessels that plied between the various ports of eastern Canada. A major development took place in 1839 when John Ericsson, a Swedish-American

inventor, produced the first screw propeller. This discovery revolutionized steamboat building, for no longer were such craft required to use the cumbersome paddle-wheels.

The first propeller-driven ship on Lake Ontario was the "Vandalia". It was built at Oswego in 1841 and was later sold to a group of Canadians. In 1842, two propeller-driven ships were built at Buffalo, in imitation of the "Vandalia", after it had passed through the Welland Canal and appeared on Lake Erie. Another propeller craft, the "Maid-of-the-Mist", appeared on the river below Niagara Falls in 1846. This tiny ship was used exclusively to transport sight-seers who were interested in a view of the falls from the river. It was not long before propeller steamers became common, although the paddle-wheel was to survive well into the 20th Century. In fact some paddle-wheel steamers are still in operation throughout the country.

Steamboats also began to appear on the smaller lakes and rivers as ship-builders sought to expand their activities. On Lake Simcoe, a tiny steamer, named after the lake, began to operate as early as 1832, while others appeared on the Kawartha Lakes and elsewhere a short time later. In Haldimand County, a steamboat was running from Dunnville to Brantford in 1844. The vessel was operated by the Grand River Navigation Company and proved to be a great convenience to the settlers, known as the "Grand River Roarers", who lived along the banks of the stream. It was not a sound financial investment, however, and was soon abandoned.

On the east coast, a steamer was in operation from Arichat, N.S. to Newfoundland in 1845. In the following year the Nova Scotia terminus was changed from Arichat to North Sydney. The boats ran twice a month during the summer and once each month in winter.

Between 1840 and 1844 a regular steamboat service was operated between Pictou, N.S. and Quebec. In the late 1840's this service was discontinued and it was not re-opened until 1858 when a continuous service was begun.

In 1842, the first steamship in the world to be propelled by a point engine, the river boat "Reindeer" was launched by Benjamin Tibbits at Saint John, N.B. Tibbits, who had designed and built both the engine and the hull, was awarded £100 commendation by the New Brunswick Legislature for his achievement.

While much attention was paid throughout this period to the development of the steamboat, the decades 1840-60 were in reality the crowning period for the sailing craft. The Great Lakes were dotted with sailing ships of every kind, including barques, brigs, sloops, schooners, barges, Durham boats and bateaux. Ports in summer were veritable hives of industry while the population of such centres was swollen by the presence of ships' captains, sailors, ship carpenters and fishermen. In winter, much time was spent in cutting timbers for use in ship-building which provided employment for large numbers of people.

Some idea of the importance of the sailing ship can be gained from the fact that in 1851 there were, in the harbour of Montreal, 468 river steamers having a tonnage of 91,488, while there were 3,141 river sailing craft with a total tonnage of 221,695. In 1863 there were over 1,000 schooners on the Great Lakes and some 330 sailing ships of other types.

At the same time the use of steamboats steadily increased. In 1845 the "Gore" sailed into Lake Huron, after passing through the Welland Canal, to carry on transport trade on the upper Lakes. Previous to this time there had not been enough trade to warrant the presence of a large ship. The continued expansion of the grain trade and the rapid settlement of the American west brought prosperous times for upper Lakes shipping.

Since early times, the rapids of the St. Lawrence River had proved to be a serious obstacle to shipping between Montreal and the Great Lakes. Attempts had been made by the construction of bateau locks to overcome some of the difficulties but as late as 1840 the trip from Montreal to Kingston was regarded as a major undertaking.

As indicated above, the construction of the Rideau Canal in 1832 had provided a means of reaching Kingston by ship from the Ottawa River, while the Lachine Canal, which opened in 1825, had overcome the Lachine Rapids in the St. Lawrence. It was not until the government made provision for the construction and improvement of canals in 1841, however, that the difficulties were finally met through the construction of the St. Lawrence canal system.

Work on the Cornwall Canal was commenced in 1834, but the outbreak of the Rebellion in 1837 and the financial depression put a halt to the project for a number of years. Construction was resumed in 1842 and the canal was open for navigation in the following year. It had six locks, each 200 feet long, 55 feet wide and 9 feet deep. These dimensions made it the largest canal in Canada until after Confederation in 1867. The Cornwall canal was designed to overcome the Long Sault Rapids, and extended from Cornwall to Dickinson's Landing, a distance of about twelve miles.

The Cascades, Cedar and Coteau rapids were overcome by the construction between 1842 and 1845 of the Beauharnois Canal. The French had built four small canals of shallow draft at this point which were later rebuilt and enlarged by the Royal Engineers. The Beauharnois Canal was located on the south side of the river between Cascades Point and Coteau Landing and extended for a distance of about fourteen miles.

Between the years 1843 and 1847 the Williamsburg Canals were constructed to complete the chain between Montreal and the Great Lakes. These three canals, known separately as the Farran's Point, Rapide Plat and Galop Canals, extend from Cardinal eastward for a distance of 27 miles, almost to the head of the Cornwall Canal. They were designed to take a vessel with a draught up to nine feet, and were later enlarged considerably.

Meanwhile the Chambly Canal connecting the St. Lawrence with Lake Champlain was completed in 1843, while work was commenced on the enlargement of the Welland

Canal in 1841. Following the completion of the St. Lawrence Canal system, the government in 1849 declared the St. Lawrence River to be open to the ships of all nations, and by 1850 it was possible for vessels drawing less than nine feet of water to proceed to sea from as far west as Chicago.

In 1853-55 a ship canal was built on the American side of the St. Mary's River which gave access for ships to the waters of Lake Superior. As indicated previously, the North West Company had constructed a canal at Sault Ste. Marie in 1797-98, consisting of one lock with a lift of nine feet. This was destroyed by the Americans during the war of 1812-14 and not re-built. It was 1895 before the canal on the Canadian side was re-opened.

The construction of railways during this period brought both steamboats and sailing ships face to face with a serious challenge. Here was a new means of transportation, both winter and summer, that promised ill for ships of *all* types, even when the possibilities of the St. Lawrence-Great Lakes system of canals were considered. The railways undoubtedly hastened the doom of the sailing ship which was so dependent on wind and weather, but the steamer was able to meet the challenge with considerable success. At some points railways and steamers combined to provide a new chapter in the story of transportation. In 1854 the first railway ferry began to operate between Windsor and Detroit, carrying both passengers and freight. Trains were broken up, the cars loaded on the ferry and conveyed to the opposite bank of the river, where the train was re-assembled. The process, however, was slow and expensive and it was some time before a vessel was devised to convey a complete train over a body of water with speed and efficiency.

Competition between the various steamboat companies was keen during this period, particularly on the St. Lawrence. Mention has already been made of the rivalry between the Molson Line and John Torrance and Company. In 1845, the Richelieu Steamboat Company was organized, and in 1856 began to operate ships on the St. Lawrence between Montreal

and Quebec. A fourth competitor appeared shortly after when the Tate Brothers put two ships in operation over the same route.

This competition led to a great decrease in fares between the two ports. In fact, it became possible to travel by steamer from Montreal to Quebec with stateroom and meals included for one dollar, while steerage passengers made the trip for twelve and one-half cents. The rivalry between the companies extended to the crews of the various ships and every effort was made to outdo competitors in matters of speed and service. This readiness to raise every possible ounce of steam in order to beat a competing ship into port, inevitably led to tragedy. The "Montreal", owned by the Torrance firm, loaded with over 400 passengers, most of whom were Scottish immigrants, caught fire, and in the resulting panic over 250 persons were either drowned or burned to death. Tragedy also struck on the Great Lakes. In 1860 the "Lady Elgin" was sunk with the loss of over 300 passengers.

In spite of these tragedies, travel by water continued to expand as population and trade increased. In 1867, when Confederation united the provinces of Nova Scotia, New Brunswick, Quebec and Ontario, there were 5,693 vessels in Canada, with a total tonnage of 767,654. The breakdown was as follows:

	<i>Number</i>	<i>Tonnage</i>
Steamers.....	335	45,766
Ships.....	164	168,612
Barks, Brigs and Brigantines....	1,051	301,943
Schooners.....	3,471	191,080
Sloops.....	61	3,686
Barges.....	348	35,258
Others.....	263	21,309
	<hr/> 5,693	<hr/> 767,654

Under the British North America Act the new Federal Government was granted the power to control all matters relating to beacons, buoys, lighthouses, navigation and shipping. As a result the construction and maintenance of

all canals, lighthouses, navigation channels, harbours, buoys and other aids to proper navigation came under the Federal Government.

Meanwhile, the steamboat had invaded the rivers of the west. In 1859, the steamer "Pioneer" made her first trip on the Red River from Georgetown. The ship was owned jointly by the Hudson's Bay Company and Messrs. J. C. and H. C. Burbank and Company of St. Paul, Minnesota. The "Pioneer" was built in the United States and carried in pieces to Georgetown where it was assembled. In 1861, the "International" a ship of 133 tons was launched by the Hudson's Bay Company and also placed in service on the Red River route. Later, the "Chief Commissioner" was built for use on the same river.

Navigation by steamer began on the Saskatchewan River about 1875 when the Hudson's Bay Company placed the "Northcote" in service. This vessel made connections with a Hudson's Bay Company steamer at the mouth of the river on Lake Winnipeg.

The discovery of gold in British Columbia in the 1850's led to a great increase in population in the western coastal regions and shipping took on a new importance. In 1870 there were 45 ships trading to British Columbia ports—17 steamers and 28 schooners. Some indication of the importance of ship-building in the province is gained from the fact that seven of the steamers and eighteen of the schooners had been built at Victoria.

The first steamer to be built west of the Red River was the "Baroness". The hull, which was constructed largely from lumber obtained from the forests of the Cypress Hills, was built at Coal Banks, near Lethbridge. In the spring of 1884 the hull floated down the Beely River to Medicine Hat, where the boilers were installed and the pilot house and upper deck constructed. At the same time, a number of scows to be used in carrying coal from the Galt Mines to the Missouri River were also built.

A second steamer, the "Alberta", was launched in 1884 at Medicine Hat. It was constructed of oak, the lumber having been brought from eastern Canada.

The days of wooden ships, however, were numbered, and shipping firms were turning to the iron hull in constructing new vessels. The first steel steamer to be wholly constructed in Canada was built at Deseronto on Lake Ontario in 1886. From that time, the steel hull was used almost entirely in the building of ships.

In 1887 the Canadian Pacific Railway chartered three Cunard steamships to operate a trans-Pacific service between Vancouver and the Orient. Thus began the Canadian Pacific Ocean Services which eventually were extended to include trans-Atlantic as well as trans-Pacific services.

By 1893, ship traffic on the Detroit River was greater than on any similar body of water in the world. In that year it exceeded 36,000,000 tons. In 1895 the number of vessels in Canadian waters totalled 7,262 of 919,163 tons. In this total were 1,718 steamers, while the remainder were sailing vessels.

The discovery of gold in the Klondike in 1896 and the subsequent influx of prospectors made transportation in those northern regions of vital importance. The White Pass and Yukon Railway from Skagway to Whitehorse was completed in 1900, and within a short time the railway began to operate a steamboat service on the Yukon River. While the company at first operated the whole distance from the Bering Sea, the main service was between Dawson and Whitehorse. From the first, the Yukon steamers were stern paddle-wheelers that used wood for fuel. The wood was stacked up at frequent intervals along the shore by contractors engaged by the company. The steamers were of considerable size and could easily accommodate 100 passengers.

Elsewhere in the north, the steamboat was coming into use at this time. In 1902 the priests and lay brothers of the Roman Catholic Mission at Peace River constructed a small steamer which was the first to run on the Peace River between Hudson's Hope and Fort Vermilion.

In 1903 a small but sturdy stern-wheeler the "Northland Sun" was launched at Athabaska Landing by Col. James Cornwall and James Barber. This staunch little vessel was used for the next ten years between Mirror Landing on Lesser Slave Lake and the Grand Rapids on the Athabaska River. In 1914 the ship was taken over the rapids and continued in service in the far north. In 1906 Cornwall and Barber built the "Northland Light" which was another stern-wheeler.

Meanwhile the vast increase in shipping on the Great Lakes and the improvement in the size and construction of ships made it necessary to enlarge many of the canals. Between 1873-1883 the Welland Canal was deepened to 12 feet on the sills and in 1887 it was further enlarged to 14 feet.

In 1892 work commenced on the Soulanges Canal. This canal, which was the longest and deepest of the St. Lawrence canals, being 14 miles long and 15 feet deep, was constructed on the north shore of the St. Lawrence River between Cascades Point and Coteau Landing. The canal was completed in 1899 and replaced the Beauharnois, which had been in use since 1845.

Meanwhile, in 1895, the Government completed the Sault Ste. Marie Canal on the Canadian side of the St. Mary's River. It consisted of one lock 900 feet long and 50 feet wide with a minimum depth of 19 feet of water on the sills.

With the building of these canals, the St. Lawrence-Great Lakes system, as we know it today, was virtually complete. On April 27, 1903, Canadian canals were made free for the ships of all nations.

Only one major project, the Welland Ship Canal, has been undertaken in the present century. Work on this vast canal was begun in 1913.

The entrance of the Welland Ship Canal was at Port Miller about three miles east of Port Dalhousie. A new route was followed from this point to Allanburg, after which the route of the old Welland Canal was followed to Port Colborne. The new canal was 25 miles long and consisted

of seven locks with a depth of 30 feet of water on the sills. The Humberstone lock on the canal had the distinction of being the longest in the world. The Welland Ship Canal was opened to navigation in 1930.

Elsewhere in Canada, as well, navigation by water was rendered more efficient by the construction of canals.

The Trent Canal system providing for navigation between Trenton on the Bay of Quinte in Lake Ontario and Georgian Bay was developed gradually over a period of nearly 100 years. First proposals to improve this waterway were made in 1827 and work commenced in 1833. By 1844 navigation was possible from Healy Falls to Peterborough where the largest lift-lock in the world was built. Construction continued at intervals and by 1907 a continuous route was established between Healy Falls and Lake Couchiching, opening nearly 200 miles of inland navigation. Further improvements were made on the system between Trenton and Rice Lake between 1908 and 1918. In 1922, however, the Canada Year Book observed that the "Trent Canal is as yet of little importance as a traffic route".

The St. Andrew's Canal was built by the Federal Government in 1910 to overcome the rapids in the Red River between Winnipeg and Selkirk in Manitoba. Traffic through the canal consisted mainly of forest and mineral products and reached as high as 70,000 tons per year.

In 1907, for the first time, the number of steamers registered in Canada exceeded the number of schooners. In that year there were 3,007 steamers registered while the number of schooners had continued to decline to 2,848. The sailing ship had for decades put up a valiant fight to keep its place in the world of trade, but the advantages of steam were overwhelming. When the steamboat combined forces with the locomotive in the field of transportation, the sailing vessel was doomed to a lingering death. While the day of the schooner was now past, a few of them remained in the coal-carrying trade on the Great Lakes until recent years.

There were, in fact, many persons in Canada who believed that, with the development of railways, lake and river shipping in Canada would be greatly reduced. This was not the case, for the enlargement of canals and the vast improvement in shipping facilities at the ports, coupled with the increased size and efficiency of lake and river steamers resulted in the waterways carrying an increasing volume of freight.

In 1910, the total tonnage carried through Canadian canals reached the impressive figure of 42,990,608 tons. Bulk commodities, of course, made up the major part of the total. Iron ore was far in the lead with 28 million tons, followed by soft coal with $4\frac{1}{2}$ million tons, wheat with $3\frac{1}{4}$ million tons and hard coal with $1\frac{1}{4}$ million tons.

In the same year, there were 7,904 vessels registered in Canada. Of this total, 3,332 were steamers while 2,786 were schooners. The remainder were small craft including scows, ferries and house-boats.

An important event occurred on June 7, 1913 when a Federal charter was granted to the Canadian Transportation Lines which had been organized to engage in shipping on the St. Lawrence and Great Lakes. In October of that year, the name was changed to the Canada Steamship Lines. From this time, a major characteristic of fresh-water shipping was the development of large shipping companies operating fleets of vessels on the St. Lawrence and Great Lakes.

The volume of traffic through Canadian canals rose to a record peak of 52,053,913 tons in 1913, a mark which has never been equalled since that time. After that date the volume fell off sharply, due in large measure to the substantial decline in the shipment of iron ore from Lake Superior to the ports on Lake Erie. By 1920 the total volume of traffic had reached a low of 8,735,383 tons. The impressive drop was still in the volume of iron ore carried. In 1913 some 32,000,000 tons of ore passed through the canals. In 1919 the total was 1,900,000 tons.

The importance of waterways, however, in the movement of goods and commodities is best illustrated by the fact that, during the economic depression in the 1930's when production was at a low ebb, the volume of traffic through Canadian canals rose steadily from 13,700,000 tons in 1929 to 21,500,000 tons in 1936.

In 1936 the National Harbours Board was established by Act of the Federal Parliament. Under this Act, the Board of three members was to function under the direction of the Minister of Transport, and was to be responsible for the administration, management and control of all harbours placed under its jurisdiction.

At first the Board had responsibility for the ports of Halifax, Saint John, Quebec, Three Rivers, Montreal, Chicoutimi and Vancouver. Later the port of Churchill and the grain elevators at Prescott on the St. Lawrence and at Port Colborne on Lake Erie were placed under the Board. All other ports in Canada remained under the control of a local harbour commission which, in turn, was responsible to the Department of Transport.

During the years of World War II, Canadian canal traffic continued to maintain about the same levels as previously. The volume of freight through all canals, both Canadian and American, however, rose to impressive heights. Where about 3,500,000 tons of iron ore had passed through the Canadian and American canals in 1932, over 94,000,000 tons of ore passed through the same canals in 1942. In fact, by 1940 the traffic through the American and Canadian canals at Sault Ste. Marie was three times as heavy as the traffic through the Panama. The record was achieved in 1942 when 120,200,814 tons of freight passed through the Sault Ste. Marie canals during the navigation season of about eight months.

The admission of Newfoundland to Confederation greatly increased Canadian water transportation facilities. Under

the terms of union, the extensive marine services and facilities of the new Province were incorporated with those already administered by the Department of Transport.

A number of public harbours, such as the harbour of St. John's, continued under the management and control of harbour commissions which are, in turn, responsible to the Department of Transport. Other public harbours in the province came directly under the Department of Transport.

The ferry services that had been operated by the Newfoundland Railway before union were taken over by the Canadian National Railways.

In 1952, there were 15,292 vessels of over 10 tons burden registered in Canada. The vast majority of vessels, of course, were found in the provinces bordering the seas, where they were employed in the great fishing industries on both coasts. Others were employed in coast-wise trade between ports spread along the extensive coast-lines. Still others were engaged in coastal passenger service, catering to both tourist and local traffic. This was especially true on the west coast where "boat-trips" through northern waters were becoming increasingly attractive to many visitors.

Within the country itself, water transportation was centered on the vital St. Lawrence-Great Lakes waterway. On 31st March, 1952, there were 257 Canadian vessels of 1,000 tons gross or over, operating on this waterway. As indicated above, a prominent feature of fresh-water shipping was the existence of large shipping companies operating fleets of ships. The Canada Steamship Lines, for example, had 54 ships of over 1,000 tons each in operation and was the largest fresh-water transportation company in the world. Other large shipping firms that operated over 20 vessels each were N. M. Paterson and Sons Ltd., Upper Lakes and St. Lawrence Navigation Co., Ltd., and the Colonial Steamships Ltd. These four shipping companies accounted for about half of the ships and barges of over 1,000 tons gross on the Lakes with a total of 137.

Some of the Lake ships are of considerable size and rank among the largest freighters of their type in the world. The "Scott Misener" of the Colonial Steamships, for example, was built in Canada in 1950 and has a gross tonnage of 13,081. The Upper Lakes and St. Lawrence Transportation Co. has one bulk freighter, the "James Norris" which was completed in 1952 and which reaches 12,463 tons. The Canada Steamship Lines has four bulk freighters, the "James Dunn", "Coverdale", "Hochelaga" and "Lemoyne", all of which exceed 10,000 tons.

Since the construction of the pipe-line from the Alberta oil-fields to the head of the Lakes, great importance has been attached to the transportation of oil to the refineries. This has resulted in the construction by Pipeline Tankers Ltd. of three large tankers in 1951 and 1952 all of which exceed 12,000 tons.

Traffic on Canadian canals continued to reach impressive figures and, when combined with that of the United States, made the Great Lakes-St. Lawrence system the busiest body of water in the world. Total tonnage through Canadian canals in 1951 was 29,325,034. The breakdown was as follows:

Agricultural Products (mainly wheat)	8,017,280 tons
Animal Products.....	6,359 "
Manufactures and Miscellaneous.....	8,670,790 "
Forest Products.....	1,606,402 "
Mineral Products.....	11,024,203 "
	<hr/>
	29,325,034 "

At present plans are being developed by the Federal Government for the construction of the St. Lawrence Seaway. This gigantic undertaking involves the construction of large works on the international stretch of the St. Lawrence River. These works include dams, canals and other projects that, when completed, will enable large ocean-going vessels to proceed right to Fort William and Port Arthur at the head of Lake Superior.

Today, as in the early days of our history, the rivers and lakes of Canada are playing an important role in the economic development of the country. The birch bark canoe with its load of furs has been succeeded by the 10,000 ton freighter with its load of wheat. Both, however, have contributed much towards making Canada the third greatest trading nation in the world.

CHAPTER II

TRANSPORTATION BY ROAD

When European explorers first reached the shores of Canada there were no roads. Great stretches of forest spread out from the water's edge as far as the eye could see. The native Indians travelled almost entirely by water, using their swift birch bark canoes, and turned to land travel only when making a portage from one body of water to another or when hunting in the forests.

Gradually, however, these portage and hunting routes came to be well-defined trails that were used by all parties passing through the region. In the absence of horses and wheeled vehicles the trails remained, of course, mere paths along which travellers proceeded on foot in single file.

The first graded road in Canada was built in 1606 under the direction of Champlain. It was purely a military road, and ran through the present Annapolis County in Nova Scotia, from Digby Gap to the fort at Port Royal—a distance of ten or twelve miles. The fortunes of the colony were such, however, that the road was of little consequence, and it was not until a much later date that road-building in the colonies was undertaken on any scale.

The French settlers who entered the valley of the St. Lawrence after 1608 quickly adopted the Indian methods of travel. The birch bark canoe became the accepted means of transportation in summer, while snowshoes and toboggans were widely used during the winter months when the frozen lakes and rivers provided smooth natural highways.

The settlers brought about a revolutionary change in land travel, however, when they introduced both horses and wheeled carts to the colony. The first horse was brought to New France in 1647 and presented to the Governor, Monsieur de Montmagny, by the inhabitants. For nearly twenty years this horse was the only one on the shores of the St.

Lawrence, and it was not until 1665 when twenty horses were imported to the colony that they ceased to be a novelty. The King of France, Louis XIV, sent out further shipments of horses in 1667 and 1670. They were for distribution among the habitants on the understanding that the owners must feed them for three years, and pay the sum of two hundred livres to the King's receiver if the animal was lost through carelessness. By 1679 there were said to be 145 horses in New France. This number rose to 218 by 1688 and a decade later had reached a total of 684.

The increasing use of horses and wheeled vehicles brought about the need for roads. The first road in New France was built by De Courcelles in 1665 from Chambly to Montreal and was sixteen miles in length.

In 1667 the supervision of roads, bridges and ferries was placed in the hands of an official called the "grand voyer". He was responsible for new works and the maintenance and repair of old ones. When deciding on what new roads to build the grand voyer would hold a meeting of the inhabitants of the district and obtain their views. If they did not agree with his decision they could make a protest to the Intendant who was the main administrative officer of the colony. While the grand voyer took a personal interest in all of the projects, he had a staff of subordinate officials who saw that the necessary work was carried out.

The actual work on the roads and bridges was done by the inhabitants themselves under the "King's corvée". This meant that each habitant was required to keep the road in front of his own land in a state of repair as one of his obligations to the King. In fact, the duty was never arduous since the system of holding land was such that the frontage along the road was seldom large. Moreover, the habitant could be relieved of his obligation by payment of a small sum of money. Refusal to do the work led to a fine, and the money thus raised was used to pay for having the work done.

The habitants had additional duties during the winter months. They were required to mark the road facing their property with poles or small cedar trees at regular intervals, so that travellers would not miss the road in the deep snow. These guide posts were considered so important that corporal punishment was meted out to any culprit who removed or destroyed them. Other duties consisted of keeping the snow beaten down in front of each farm and the removal of drifts and ruts. One Intendant went so far as to order each habitant "to lead his cattle incessantly up and down the road to trample down the snow". Excessive speed on roads was given early consideration by the authorities and a fine of ten francs was provided for any person who trotted or galloped his horse in the vicinity of a church on Sundays.

There were three main types of road in New France—"chemins royaux et de poste", "chemins de communication", and "chemins de moulin". The first were the main roads and were supposed to be 24 feet wide with three-foot ditches on each side. The second were connecting roads for farms not lying along a royal road. They were to be 18 feet wide and also have ditches. The third were mill roads of no particular width and were built on orders of the seignior.

These early roads were largely made of earth although stone was occasionally used on the surface. In low, marshy spots, trees were felled and laid side by side to form a wooden or "corduroy" surface. All bridges were of wooden construction and most of the larger ones were built by "corvée". For many years, however, bridges were lacking, and the roads crossed streams at shallow places or fords where no bridge was necessary. Ferries were sometimes run across the wider rivers by private individuals who charged a toll for such service.

While promising plans were laid down for road construction and maintenance as early as 1665 little progress was made except on a local scale. Roads gradually developed in the immediate neighbourhood of Montreal, Quebec and Three

Rivers, but it was still necessary in 1674 for Perrot, Governor of Montreal, and Abbé Fenelon to walk from Montreal to Quebec on snowshoes.

It was not until the eighteenth century that road-building projects other than local works were undertaken. In 1721 permission was granted to Monsieur Lanouiller de Boisclerc to build a road from Quebec to Montreal. Progress was inevitably slow since the road was built in sections, but by 1734 vehicles were able to proceed by road between the two centres. It was not an easy way to travel, however, for it took four days to go from Quebec to Three Rivers. In 1735 Lanouiller wrote that he had driven in a carriage from Montreal to Quebec in four and a half days during the summer. By 1763 the road stretched from Cap Tourmente to Montreal.

Along the south shore of the St. Lawrence some roads were also being built during this period. In 1739 a road was begun from Laprairie to Fort Chambly along which settlement soon spread. It was not until after 1763, however, that the south shore road was completed by army engineers on orders from General Murray.

Meanwhile, the breeding of horses had become so popular that it caused some concern among the colonial officials. As early as 1709 the Intendant Raudot issued an ordinance forbidding the habitants of the Montreal district to keep more than two horses or mares and one foal on each farm. The only exception was public drivers, who might keep as many horses as were necessary for their work. In 1710 Vaudreuil wrote to his Minister in France that there were so many horses in the colony that "the young men were losing the art of walking, with or without snowshoes". In 1757 horse-flesh was used for food among the troops in Quebec, and Montcalm saw fit to mention in his diary on December 9th that "it is in the political interest of the colony that the breeding of horses be diminished, the habitants having too many of them and not applying themselves enough to the raising of cattle". By 1765 there were 13,488 horses in the colony, or one for every five inhabitants.

Throughout the French period there were two distinctive types of vehicles in use—the caleche and the carriage. The caleche was described by one writer as “a gig upon grass-hopper springs with a seat for two passengers; the driver occupies the site of the dashboard, with his feet on the shafts and in close proximity to the horse with which he maintains a confidential conversation throughout the journey. . . .” The popularity of this vehicle was such that a few are still to be seen in the province of Quebec. The carriage replaced the caleche in winter. It was a sleigh with single runners and a seat for two persons. Bundled up in warm clothing and covered with fur robes, travellers would proceed on their journey from one settlement to another at a rapid pace. Full use was made of the frozen lakes and rivers along the route, for they were free of stumps, rocks and other obstacles that were to be encountered on the newly opened roads.

As mentioned above, the first road in Nova Scotia had been built by Champlain in 1606. So little progress was made after that date, however, that in 1750 there were practically no roads in the province that could be used by wheeled vehicles. In 1754 the inhabitants of Lunenburg were said to be engaged in opening roads although it is probable that these early roads were only for local purposes. A trunk road was planned during this period between Halifax and the Bay of Fundy. By 1766 the road stretched from Halifax to Windsor although it was claimed to be “in an imperfect state”. The road from Windsor to Annapolis was also improved and a system of post-houses established along the entire route from Halifax to Annapolis, a distance of 133 miles.

However, by 1785, when the United Empire Loyalists entered Nova Scotia in considerable numbers, there were only two roads of any importance in the whole province—one running from Halifax to Windsor, and the other from Halifax to Truro. In the summer months, wagons could travel both of these roads without difficulty, but in the spring and fall, it was all that a traveller could do to make progress on horseback. In describing a journey from Halifax to Truro about

this time, Dr. James McGregor wrote “. . . in every place where it was wet, the horses had to wade nearly to the knees, and often far above them, in mud or water . . . I was very thankful for our safety as the greater part of the road was both difficult and dangerous, on account of the many swamps full of roots and logs, which we had to pass . . .”. Nevertheless, some progress was made, and by 1792 it was possible to proceed by road from Halifax to Pictou on the Gulf of St. Lawrence.

In Prince Edward Island, the arrival of Governor Patterson in 1770 led to the rapid development of roads. The energetic governor was an enthusiastic road-builder, and when government funds were not available for the purpose, he used his own money. He was impressed by the fact that there was no way of travelling between Charlottetown and the other settlements on the Island except by water. To reach Princetown required an arduous journey of two weeks. The traveller proceeded up the Hillsborough River by boat, thence by land to St. Peter, from which place he might be fortunate enough to get passage by water to Richmond Bay. If, on the other hand, Georgetown was his destination, the traveller again set out for St. Peter, where he proceeded by water as chance provided. At the insistence of Lieutenant Governor Patterson a road to Princetown was built within a year. The road was only thirty-three miles in length and avoided “all swamps, difficult rivers, and steep hills”. A second road was also undertaken to connect the head of the Hillsborough River with the headwaters of the Montague, thence on to Georgetown. The Governor asked for five companies of soldiers, with a view to employing them on his favourite road projects. The pretext was that the soldiers were to guard the settlement against insurrection of French inhabitants, against the raids of privateers and of Indians from the mainland.

The arrival of considerable numbers of Loyalist settlers in the Saint John River valley of New Brunswick rapidly created the need for roads in that region. As early as 1786

plans were being discussed for four main roads in the area—one from Saint John to Charlotte County, one from Saint John to Westmorland, one from Saint John to Fredericton, and another from Fredericton to the Miramichi.

By 1785 mail was reaching Saint John from Halifax, use being made of the old Temiscouata portage route. Starting at Halifax the mail was transported over the Windsor road to Annapolis. Here it was placed on board ship and conveyed to Saint John. Travellers could continue beyond Saint John as far as Grand Falls by boat, or could go by land to Fredericton over a passable road. It was possible to go another eighty-five miles to Presqu'Île by land since a road had been blazed to that point, although as late as 1819 this road was declared to be in wretched condition.

The rivers, however, remained for many years the principal routes of travel in both summer and winter. Even the members of the Legislature resorted to sleighs on the frozen rivers when they gathered to attend the sessions at Fredericton.

Travel to the west from the Saint John River settlements presented a different picture. In 1791 Mrs. Simcoe, while at Quebec, noted in her diary that "Capt. Shaw, of the Queen's Rangers, and four other gentlemen arrived from Fredericton, in New Brunswick, which is 370 miles from hence. They walked on snow shoes 240 miles in 19 days, came up the river St. John, and crossed many small lakes. Their mode of travelling was to set out at daybreak, walk till twelve, when they stood ten minutes (not longer, because of the cold) to eat. They then resumed walking till half-past four, when they chose a spot, where there was good firewood, to encamp. Half the party (which consisted of 12) began felling wood; the rest dug away the snow till they had made a pit many feet in circumference, in which the fire was to be made. They cut cedar and pine branches, laid a blanket on them, and wrapping themselves in another, found it sufficiently warm, with their feet close to a large fire, which was kept up all night."

Following the cession of the French province of Canada to the British in 1763, little change was made in the system of government. The practice was followed of appointing a grand voyer for the three districts into which the province was divided—Quebec, Three Rivers, and Montreal. This officer was required to visit from time to time all the roads in his particular district. After deciding the roadwork that was required, he obtained a written order from a Justice of the Peace. Bailiffs or captains of militia actually supervised the work.

The system of labour was the same as that used in the colony during the French period. Every landholder was obliged to build and maintain the roads and bridges which faced his own property. Failure to appear for work resulted in a fine, while refusal to perform the work led to a special fine. The change from French to British rule brought about no change, however, in the reluctance on the part of the habitants to perform such road work. The grand voyer of Quebec, for instance, found it necessary to issue a stern warning on one occasion that "The Roads in this district being in bad repair, those persons who by Law are bound to keep them in good order are hereby required to mend them in ten days in the way and manner directed by the Ordinance. Wherever it shall be found that the necessary work has been neglected or has been done in a slight superficial way, the Grand Voyer will employ people to do the work conforming to the Ordinance, at the expense of the person or persons heedless of the notice."

Following the completion of the road between Quebec and Montreal and the establishment of post-houses, it was not long before carriages for hire made their appearance. By 1767 advertisements were appearing of masters of the post-houses who were prepared to furnish carriages on short notice for the journey between Quebec and Montreal or between Montreal and Albany in New York.

The journey, however, was far from pleasant and remained difficult for some time. In 1792, Mrs. Simcoe in describing in her diary a journey from Quebec to Montreal

had this to say . . . "Here we went on shore, intending to go by land the remaining three leagues to Montreal. We found Captain Stevenson just arrived in Mr. Frobisher's phaeton, sent for me, as a hired caleche is a wretched conveyance on the excessive rough roads around Montreal. Notwithstanding the merits of the phaeton and the driver, I every moment expected to have been thrown out by the violent jerks in passing over the ruts in this bad road." A further entry in her diary reads "We went from Montreal to La Chine (Lachine), ten miles of very rough road, in Mr. Frobisher's carriage."

Following the American Revolution, large numbers of United Empire Loyalists were granted land along the shores of the St. Lawrence River and Lake Ontario. At the time of the arrival of these new settlers there were no roads in the whole region that were worthy of the name. Progress in road construction was slow, owing to the facilities offered by water. In time, however, the necessity of having land communication between farms and settlements led to the opening of blazed trails that were gradually widened into roads capable of taking wagons and carriages.

By the time the province of Upper Canada was created in 1791, a highway had been blazed from Montreal to Kingston, and was considered to be open for the purpose of conveying mail. In fact, however, it was complete only from Montreal to Lake St. Francis, and from Cornwall to Prescott. Travel by water was good along the remaining stretches and there was little incentive to build roads. Travel along this road even on horseback was not without its hazards. In describing the bridges along the road from Montreal to Kingston, Mrs. Simcoe noted in her diary that ". . . It is certainly necessary to have a horse of the country to pass the bridges we everywhere met with, whether across the creeks (very small rivers) or swamps. The bridges are composed of trunks of trees unhewn, of unequal sizes, and laid loosely across pieces of timber placed lengthways. Rotten trees sometimes give way and a horse's leg slips through, and is

in danger of being broken. The horse I am now riding had once a fall through an old bridge. He now goes very carefully."

During the winter months travel between Montreal and York (Toronto) was practically at a standstill. About the only means of communication was the "express" which was run once each winter from Montreal to Detroit by the army and certain Montreal merchants. The express consisted of a white man, accompanied by one or two Indian guides, who carried the mail that had accumulated since the close of navigation. They travelled on snow-shoes along the St. Lawrence as far as Kingston where they crossed to Oswego, thence west along the south shore of Lake Ontario to Niagara. A well-known trail along the north shore of Lake Erie brought them to Detroit.

The arrival of Colonel Simcoe in Upper Canada as Lieutenant Governor led to an immediate programme of road-building. Colonel Simcoe was satisfied that roads were a military necessity since the water routes were open to attack from the United States in case of war.

In February 1793 the Governor set out from Niagara on a visit to Detroit. Some indication of the preparations needed for such a journey at that time is found in a letter from Mrs. Simcoe to a friend in England—"Coll. Simcoe is gone to Detroit, on foot the greatest part of the way, a journey of about 400 miles, but as I am convinced the exercise and air will do his health and spirits great good I rejoice in his absence, though it will be a month or six weeks; he has five officers as companions, a dozen soldiers and twenty Indians with him as guides." Details of the actual journey are found in the following passage in Mrs. Simcoe's diary—"The Governor rose early on the march and walked till five o'clock. A party of the Indians went on an hour before, to cut down wood for a fire and make huts of trees, which they cover with bark so dexterously that no rain can penetrate, and this they do very expeditiously; when the Governor came to the spot the Indians had fixed upon the lodge for the night, the

provisions were cooked; after supper the officers sung 'God Save the King', and went to sleep with their feet close to an immense fire, which was kept up all night." Such was the means of travel between Niagara and Detroit for so important an official as the Governor of the province a little more than one hundred and fifty years ago.

Upon his return, Colonel Simcoe ordered soldiers from the Queen's Rangers to begin work on "Dundas Street", a road that was to run from the head of Lake Ontario to London, which the Governor proposed to make the capital of the province. It thus became the first road-building project in what is now western Ontario. The first stretch to be completed was from Dundas to London, although in a few years it was extended east as far as York.

In the absence of government funds for the purpose, the responsibility for building and repairing roads fell upon the inhabitants themselves. An Act of the first Parliament of Upper Canada in 1793 placed all roads under the supervision of overseers called pathmasters, who were appointed by resident ratepayers at the annual township meeting. The Act also required everyone to work from three to twelve days on the roads using his own tools. The amount of time to be spent by each person was determined by the value of the property he held, while those owning horses and carts were required to work for at least six days.

The system of statute labour met with numerous difficulties. Enforcement was lax, for the most part, owing to the indifference of local officials, while persons summoned for work on the roads could be relieved of such obligation through payment of 2s 6d per day.

A major obstacle to the development of roads in Upper Canada during this period was the land set aside as clergy reserves or held by absentee owners. These unoccupied stretches often lay directly in the path of a main road between settlements. Since the holders of such lands were not obliged to build or maintain roads, it often happened that the road

came to an end at the boundary of their extensive property. In other instances a road was blazed but in the absence of settlers, soon fell into a state of disrepair.

The need for roads soon led many of the early settlers to join forces in building "subscription" roads through their own regions without assistance or pressure from the government. The first settlers in the Niagara region, for example, promptly set about blazing a road across their entire settlement from Niagara to Ancaster. The road was opened by 1785.

An early account of the settlement of Oxford County after 1794 pointed out that "... These settlers, being aware of the importance of roads in raising the value of property, early set about to open and extend them; and, notwithstanding the numerous discouragements and the immediate necessities of their families, they in one year, at the expense of Mr. Thomas Ingersoll, cut and bridged a road from Burford to Le Trenche, through a wilderness of 25 or 30 miles. Mr. Elisha Putnam of that town (Oxford) by subscription has since continued the road to Allen's, Delaware Township . . .".

In 1795 Colonel Simcoe turned his attention to another road project—the building of Yonge Street, so named after Sir George Yonge, Minister of War in the British Cabinet. This was to be a connecting link between Lake Ontario and Lake Simcoe that would replace the old portage route to the upper Lakes. Once again the Queen's Rangers were employed on the job. By the spring of the following year the road was declared open, although Mrs. Simcoe was prompted to write that "... the road is as yet very bad; there are pools of water among roots of trees and fallen logs in swampy spots, and these pools, being half frozen, render them still more disagreeable when the horses plunge into them."

The North-West Company took a keen interest in the opening of a land route from Lake Ontario to Lake Simcoe, since it formed an important link in their trade route to Michilimackinac and the western plains. The Company contributed large sums of money towards the improvement of Yonge Street, and were soon making considerable use of the

route. The boats of the Company followed the shores of Lake Ontario to York thence on wheels over Yonge Street to Lake Simcoe. The portage was not an easy one, however, for the report of one surveyor indicated that the greater part of the road was "not passable for any carriage whatever on account of logs which lie in the street".

The building of roads along the shores of Lake Ontario was delayed by the fact that travel by water between Kingston and York was convenient and swift. The early Loyalist settlers made a start, however, when they constructed the road between Kingston and Bath. For the most part, the shore of the lake was the only track along which travellers might proceed from Kingston to York on foot. The general absence of bridges was a further discouragement to land travel and it was not until the close of the eighteenth century that a mail road was planned from York to Montreal.

In 1798 Asa Danforth, an American, contracted to blaze a road forty feet wide along the shore of Lake Ontario from Kingston to York at a cost of \$90 a mile. The course of the road, which came to be known as the Danforth road, was from Kingston to Bath, thence to Adolphustown and Dorland's (later Young's) Point. A ferry conveyed travellers to Lake-on-the-Mountain whence the road crossed Prince Edward County and then followed the shore of the lake to York.

By 1801 the Danforth road was said to be open from Kingston to Ancaster, although the absence of bridges over many of the rivers made the route a hazardous one for the ordinary traveller. It was not long before great stretches of it had fallen into a state of disrepair, owing to the lack of settlement and local interest. At best it was little better than a blazed trail, and it was some years before the road had any value as a route for long-distance travel.

The first public stage-coaches in Upper Canada were placed in operation about this time by J. Fanning of Chippawa. The coaches ran between Chippawa, Niagara (Newark)

and Fort Erie, and were described by the owner as "easy as any in the province, and the goodness of the horses and carefulness of the driver are exceeded by none".

In 1801 advertisements appeared for the "Niagara and Chippawa Stages" operated by James Macklim and Markle and Hamilton. The fare was four shillings from Niagara to Queenston or from Chippawa to Queenston. The rates for 150 pounds of baggage were the same as for one passenger, but any person travelling in the coach could take fourteen pounds of baggage free of charge. At first the public stages carried the mail as well, but when "postmasters' stages" were established on August 1st, 1801, between Niagara, Queenston and Chippawa, the mail service was transferred to them.

At the opening of the nineteenth century, therefore, the development of roads in Upper Canada was very incomplete. Water transport was still preferred by travellers who had any regard for time or personal convenience. During all except the winter months the quickest way to complete a journey was on foot. It was a common thing for the first settlers in Finch Township, for example, to shoulder a bag of wheat, walk fifteen miles through the woods to a mill on the St. Lawrence river and return with the flour in the same manner. The traveller, whether on foot or on horseback, often carried with him a quantity of dry cedar bark. If wolves appeared to be a danger, the bark was set on fire to scare the animals off.

Most of the land travel, as a result, was done in winter. Along the road from Montreal to Kingston, goods were transported by "Canadian trains". The trains consisted of a number of short sleighs with long runners, each drawn by one or two Canadian ponies ". . . The men were dressed in blankets or *etoffe du pays*, capotes and trousers with sash begirt waist; feet shod with beef moccasins, and head covered with a bonnet rouge or bleu, trudged along behind their loaded sleighs, occasionally cracking their short-handled long-lashed whips or calling out '*marche donc*' if a horse appeared to be forgetting his duty."

As settlers moved inland from the main rivers and lakes, the need for roads increased. The inhabitants of outlying regions were keenly aware of their isolation and took immediate steps to link their scattered settlements by roads. In 1800 Messrs Ward and Smith cut a road from Dundas to Waterloo County as an encouragement to German settlers who were beginning to enter the district at that time. The road traversed the notorious Beverly Swamp, which resulted in many adventurous tales by travellers who made use of the route. Three years later the Selkirk settlers who had taken up land at Baldoon near Lake St. Clair, began the construction of the Baldoon road from Lake St. Clair to Chatham on the Thames River. Both of these roads were built without government assistance. Such aid was now recognized as a necessity, however, if the work of building roads was to advance with the expansion of settlement.

The first government appropriation for roads in the province was made in 1804 when £1,000 was set aside for the purpose. By 1816 the grants had reached £21,000.

Meanwhile the work of building roads in Lower Canada went slowly forward. The operation of stage-coaches with post-houses conveniently located along the route improved the lot of travellers to such an extent that one was prompted to write at the end of the eighteenth century, "Travelling in this province is easy and expeditious. A public mail-stage runs from St. Johns to Quebec." Mrs. Simcoe, however, was not impressed with the road from Lachine to Montreal in September 1794, for she wrote ". . . I waited there (Lachine) two hours for a caleche, and set out in it with Frances, but the road was so rough and the carriage so indifferent that I was obliged to stop and take Collins with me to hold the child, or we should have been shaken out. I was so fatigued with this eight miles to Montreal that I determined never to go in a post caleche again. The carriage was driven tandem, the first horse tied to the other by a rope, which did not in the least confine him. The horses generally went different ways and at a great rate."

In 1805 a new departure was made in road-building with the passage of an Act in Lower Canada establishing the first turnpike road. This method of road-making was common in England and soon found favour in Canada. A group of people formed themselves into a "turnpike trust" which agreed to build and maintain certain roads. In return the trust was empowered to collect tolls from all travellers who used their roads. It was inevitable that many turnpike trusts should regard the revenue thus acquired as profits to be pocketed, while the condition of the turnpikes became worse and worse from lack of maintenance. The system, however, was highly favoured and it was not long before petitions for the establishment of toll roads and bridges were pouring into the legislature. It is perhaps not without significance that the submission of the petitions was accompanied by a public warning in the newspapers that was to allow the inhabitants in the area through which the turnpike was to pass to register their objections to the proposal.

Statutory labour was continued in the province although it was recognized as an inefficient method of developing roads. The grand voyers were also retained but the tasks performed by the captains of militia were handed over to sous-voyers or inspectors.

The urgent need for better roads, however, led the government of Lower Canada to introduce another method of road-building. In 1806 the executive council called for tenders for the construction of several roads of specified width and character. The contractors were to be paid by grants of land lying along the roads which they could sell as the roads opened the regions to settlement. In some cases, contractors were paid from income derived from commutation of statute labour and from fines.

Throughout this period there was a steady influx of settlers from Vermont and New Hampshire into the Eastern Townships of Lower Canada. Shipton, on the Nicolet River, was one of their first regions of settlement under the leadership of Elmer Cushing and William Bernard. The settlements of

Brompton, Melbourne and Ascot were begun in a similar manner and it was not long before these settlers from the United States formed the main element in the Eastern Townships.

The rapid growth of this "American community" came to the attention of Governor Craig in 1810. He decided to link the interests of the settlement with those of Quebec City by the construction of "Craig's Road". The road was to run from Quebec to Shipton, a distance of sixty miles through uninhabited forest, where it joined a road leading to the frontier.

When the Assembly refused to grant funds for the purpose, Craig constructed the road himself, making use of soldiers from the local garrison and granting lands to cover the expense. The road provided a new outlet for local products and reduced the prices of meat and other provisions in the city. It was not long before settlers established themselves along the road. Drummondville, founded after the War of 1812-14 by Major-General Heriot, was one of the early settlements on "Craig's Road".

Some progress was also being made in travel facilities. In 1808 the first public stage began to run between Montreal and Kingston although service was somewhat irregular. In Lower Canada the most important stage route was from Montreal to Quebec. In 1811 four-horse coaches ran between the two centres twice each week during the winter and three times in the summer. The journey was completed in two days, but they were very long days, for the coach started off at four o'clock each morning and continued to travel until eight in the evening. By 1812 the service had been extended to six days a week. In addition a stage ran once a week from Montreal to the Long Sault on the Ottawa River where passengers and mail going to Hull were transferred to boats.

Throughout this period, the privilege of operating stage-coaches rested with the *maîtres de poste*. The cost of a journey by stage varied from twenty cents to twenty-five cents a league, or \$12 to \$15 for the trip from Quebec to Montreal.

But the highways lent little encouragement to extensive travel. The only centres that were served by passable roads at this time in Lower Canada were Quebec and Montreal. In 1815, however, the government of that province began to aid road-building with a financial grant. In the years 1815 to 1817 grants of £63,600 were made, while in the period 1829-31 the sum of £120,000 was voted for this purpose.

Meanwhile the government of Upper Canada was entering more actively into the field of road-building. In 1804 tenders were asked for roadwork, and bridges on the Lake Shore Road "from Peter Street in York to Burlington Bay". The road was to be a continuation of Queen Street and was to be thirty-three feet wide. Action was slow, however, for there was still talk in 1808 of the need for such a road.

A major difficulty lay in the fact that roads, once built, quickly fell into a state of disrepair. Dundas Street, which had been started under Colonel Simcoe in 1793 and finally completed by Asa Danforth in 1800, had fallen into such a condition by 1806 that tenders were called for by the road commissioners of the Home District for "the opening of the road called Dundas Street, leading through the Indian Reserve at the River Credit, and also to erect a bridge over the same river, and to bridge and causeway the road beyond as an aid to statute labour, which is not sufficient."

The efforts of Colonel Thomas Talbot to establish a settlement in the Township of Dunwich in Upper Canada led to the construction of the famous Talbot Road about this time. Colonel Talbot arrived from England in 1803 having been granted five thousand acres of land by Lord Hobart, the Colonial Secretary. He immediately set about constructing a home in the Township of Dunwich and at the same time offering land to settlers who would undertake to clear a strip one hundred feet wide across their lots along the road, build a house at least fifteen by twenty feet, and live on their property for five years.

Talbot realized that ready means of communication were essential to the success of the settlement and he undertook in 1809 to construct a suitable road. This programme of

road-building induced more settlers to take up land in the region with the result that settlement spread rapidly. The Talbot Road was gradually extended until its two branches reached from Fort Erie to Sandwich and from Port Talbot to London. The road was not held up by the existence of reserved lands, with the result that before many years had passed it was known to be the best in the province.

For many years, however, it was common for the settlers to walk long distances in preference to using either horses or vehicles on the roads. Garrett Oakes, one of the pioneers of the Talbot Settlement, stated that during the War of 1812-14 the settlers had to get their salt from the nearest store at Port Ryerse on Long Point, pay \$12 a bushel for it and carry it home on their backs. One man was said to have walked two hundred miles when he at last reached home with his salt.

The War of 1812-14 brought the need for more roads into sharp focus. The movement of soldiers and supplies along the border of Canada and the United States during the War was severely hampered by the lack of roads. Following the War, efforts were made to complete the main east-west roads as a military necessity. The Kingston Road, which followed some parts of the Danforth Road but was in the main closer to the shore line, was completed from Montreal to Kingston in 1816. In the following year the road was extended to York. As a result, long-distance travel by road was now possible, especially in the winter. During other seasons, however, little attempt was made to use wheeled vehicles and most travellers proceeded on horseback or, for short journeys, on foot.

On January 1, 1816, a regular stage line was established between Montreal and Kingston by Barnabas Dickinson. The stage, consisting of horses and covered sleighs, left Montreal and Kingston on Mondays and Thursdays, the points of departure being Samuel Hedge's, St. Paul St., Montreal, and Robert Walker's Hotel in Kingston. They reached their destination on Wednesdays and Saturdays. In summer, a stage-wagon carried the mail from Montreal

to Prescott where it was transferred to riders on horseback for the remainder of the journey. In the same year, the first stage began operation between York and Niagara, the fare being \$5 per passenger. In 1817, a stage service between Kingston and York was established with the fare set at \$18.

At the same time, many sections of the Danforth Road were in very bad condition due to lack of road repairs. The long stretches of reserved or unsettled land meant that no road work was done in those regions. As a result, the Road was little more than a path along which travellers proceeded at a snail's pace.

During the War of 1812 efforts were also made to continue the development of Yonge Street northward from Lake Simcoe. A body of soldiers under William Dunlop built a portage road nine miles long from the present site of Barrie on Kempenfeldt Bay to Willow Creek. The completion of this road in the winter of 1814-15 resulted in speedier communication between York and Penetanguishene. At the same time efforts were made to blaze a roadway over the entire distance, but it was some years before it was of much value owing to its poor condition.

Meanwhile an increasing number of settlers were entering the Ottawa River district. A group of American settlers under the leadership of Philemon Wright had taken up land at Hull in 1800, but it was not until 1816 that the area across the river was taken up by settlers. By 1818, the Richmond Road, running from Perth to Richmond, had been blazed by soldier settlers, while a further road had been opened northwards from Brockville on the St. Lawrence River. Some idea of its condition in 1820, however, may be gained from the fact that the regular rate of travel over it was two miles per hour.

By 1815 some further progress had been made in building roads in Nova Scotia. The Halifax-Truro road had been extended as far as Pictou, making a total of 160 miles of highway in the province. At this time the system of statute labour was introduced and considerable advances were made in road-building during the next few years.

The first stage coach began to operate in the province in 1816 when Isaiah Smaith received a government grant of £100 to carry passengers and mail from Halifax to Windsor twice a week. Fare for the journey was \$6, with the coach having room for six people.

A weekly stage between Halifax and Pictou by way of Truro was also established in the same year, and the service was later extended to Annapolis Royal. By 1833 stage coaches were also running from Windsor to Liverpool. Advertisements in a Halifax newspaper in 1837 indicated that a stage coach would carry passengers from Halifax to Truro for £1, while the fare to Pictou was £1.10.0. Passengers for intermediate points were charged fivepence a mile. By 1837 Joseph Howe was prompted to remark with considerable pride that "had any one told them, ten years ago, when Hamilton used to carry the mail on horseback, from Halifax to Annapolis, and sometimes in a little cart, with a solitary passenger beside him, who looked as if he was going to the end of the world, and expected to pay accordingly, that they should have lived to see a Stage Coach, drawn by four horses, running three times a week on the same road . . . would they have believed, had they travelled on foot with Stewart, the Old Postman from Pictou to Halifax, who used to carry the mail in his Jacket pocket, and a gun to shoot partridges for sale as he went along, that before their heads were cold they would travel the same places in a Coach and four, with a ton of letters and papers strapped on before and behind?"

In New Brunswick the first attempt was made in 1816 to distinguish between local roads and the "great roads of communication". Each of the great roads was described in a statute and provision was made for the appointment of three paid supervisors for each road. They were to see that the necessary roadwork was done and the accounts submitted to the Assembly. As in Nova Scotia, statute labour might be employed but the supervisors were advised to let contracts for the work.

In 1819 a road was constructed across country from Fredericton to Miramichi, while a further road was built a

few years later to serve the country along the east coast from Shediac to Chatham. The main road from Saint John to Fredericton which followed the Saint John River was supplemented in 1826 by another road between the two towns which ran along the valley of the Nerepis River.

While progress had been made in the development of roads in Nova Scotia and New Brunswick as outlined above, travel overland between the provinces was a major undertaking. In 1814 a British army officer made the journey from Halifax to Quebec and left a vivid account of the difficulties encountered. He went by sleigh from Halifax to Annapolis at a cost of eight dollars. The second stage from Annapolis to Digby cost sixteen dollars. At this point he crossed by ship to Saint John, where he resumed his journey by sleigh making use of the ice on the river as far as Fredericton. The cost from Saint John to Fredericton was twenty-eight dollars. Hiring another sleigh for thirty-two dollars he proceeded to Presqu'Isle, a distance of 85 miles. At this point the use of vehicles was abandoned, and he walked on snowshoes to Rivière du Loup with guides hauling his baggage on toboggans. Two days later he arrived at Quebec having completed the 111 miles from Rivière du Loup in a carriage.

By 1825 it was possible to proceed, with considerable difficulty, from Fredericton to Quebec by road. Some idea of its condition, however, may be gained from a report submitted to Sir James Kempt by a post office official in 1830. A carriage leaving Quebec could proceed along a fairly good road at five or six miles an hour as far as Notre Dame du Portage. At that point the difficulties began. For thirty-six miles to Temiscouata the road was useless for wheeled vehicles with the exception of occasional stretches. There was no road at all for the next forty-five miles, so that passengers and mail had to be transported over Lake Temiscouata. Beyond that point no road existed for another thirty-six miles and travellers made use of the Madawaska River as far as Grand Falls. A road had been blazed from Grand Falls to Aroostook River, a distance of nineteen miles, but it was unfit for use at most seasons. The road from Aroostook

to Woodstock, fifty-six miles in length, was in a much better state of repair although wheeled vehicles were still out of the question. The final stretch from Woodstock to Fredericton was sixty miles in length, and in a reasonable state although the absence of bridges was a constant problem for travellers. It was impossible to use a vehicle of any description over the route except in winter when the frozen lakes and rivers could be used. In fact, even on foot, the mail couriers could not make the entire journey except in the winter months when snowshoes could be used.

Efforts to improve land travel between the provinces continued however. The impetus came from Sir James Kempt who was the Lieutenant-Governor of Nova Scotia from 1820 to 1828 and the Administrator of Lower Canada from 1828 to 1830. He undertook to build a military road between the provinces that would avoid the American border. The Kempt Road, as it was called, ran for a distance of 455 miles from Metis in Lower Canada to Campbelltown, Bathurst, Chatham, Shediac, and finally Amherst in Nova Scotia. From this point roads led to Truro and Halifax.

By 1833 over £7,000 had been spent on the section of the Kempt Road between Metis and the Restigouche but in 1840 the road was in a most wretched condition. A survey of the road by the New Brunswick Legislature revealed that it ran through swamps and over mountains, while at certain times of year the mail couriers were reduced to carrying their loads on their backs. Carriages could proceed for a distance of fourteen miles above Fredericton, but only in the summer time. Grades along the road were often as much as fourteen per cent. A traveller over the road in 1849 declared "This road between the rivers is a very rude and difficult one. It is barely blocked out of sufficient width to allow a waggon with one horse to pass. The trees are cut down and hauled off, boulder stones and small inequalities removed, and bridges built where they are absolutely necessary. Only the horses of the country, which all their lives have been trained to it, could conduct even light waggons across the numerous steep hills over which the road passes."

In spite of the difficulties to be met, travellers did make use of the roads, paying twenty shillings for the sixty-five mile journey by stage from Saint John to Fredericton. The more rugged travellers who ventured to journey from Saint John to Quebec by road were required to pay £12 10s. and even more if they wished to enjoy the luxury of a private vehicle.

While the government of Lower Canada began to assist road-building through the issue of grants in 1815, progress was slow. There was no road at all between Hull on the Ottawa River and Montreal in 1820, travellers making use of the river as a means of communication in both winter and summer. In 1828, however, a grant was made for the completion of a road from Montreal to Hull, parts of which had meanwhile been blazed.

In the interior of the province between Quebec and Montreal some roads had been opened north from the St. Lawrence River by 1830. As a rule they followed the river valleys and were used for local travel to towns and villages along the main Montreal-Quebec road. There was still no means of communication across country in the interior districts. East of Quebec, travel was confined almost entirely to the St. Lawrence River because of the rough nature of the region.

South of the St. Lawrence, progress was more rapid as settlement increased in the interior districts. The close proximity of the United States and the continued movement of settlers across the American border into the Eastern Townships rapidly brought the construction of north-south roads. In 1830 the Kennebec Road was completed from Quebec to the American boundary along the valley of the Chaudière River. This road gained importance from the fact that it made land travel possible from Quebec to Boston. About the same time a road was opened along the Richelieu River that provided a means of reaching New York from Montreal. In fact, by 1827 it was possible to make the

journey from Montreal to Albany, N.Y. in three days. By 1829 a stage line ran from Montreal to Stanstead in two days and made connections with the American stage at that point.

The activities of the British American Land Company in settling the Eastern Townships did much to promote road-building. By 1835 three main roads connecting the Townships with the St. Lawrence were in operation: Quebec to Sherbrooke via St. Nicholas, a distance of 120 miles; Montreal through Chambly and Granby to Sherbrooke, 100 miles; and Three Rivers and Port St. Francis along the shores of the St. Francis River through Drummondville and Melbourne to Sherbrooke, 120 miles. In that year, the regular charge for moving freight by road from Port St. Francis to Sherbrooke was twenty cents per ton per mile, or about \$24 per ton for the entire distance.

In spite of the activities outlined above in the construction of roads, it can be said that only Montreal and Quebec were served by good roads prior to 1840, and these roads were controlled by the turnpike trusts. Travel on the other roads, while possible at certain seasons, was a strenuous undertaking and not to be considered if other means of transportation were available.

In Upper Canada the most important development in the 1820's was the building of the Huron Road. Undertaken largely by the Canada Company, the road was begun in 1827 as an inducement for settlers to take up land in the region served by the road. Mr. Absalom Slade was in charge of the construction work from Galt to Guelph, while Messrs. Campbell, Dunlop and Pryor of the Canada Company directed the work between Guelph and Goderich. For years, however, the road was largely corduroy with stumps of considerable size left standing. The surface was mainly earth, which rapidly turned to mud in wet weather.

The journey of Mrs. Strickland, wife of an employee of the Canada Company, from Guelph to Goderich gives some idea of travel along the Huron Road after its completion. She hired a settler to transport herself, her child, and a servant

girl in his ox-cart, and the first two days of the journey were quite satisfactory. On the third day, however, difficulties began when the cart was upset twice in five miles. For the remaining distance of sixty miles, Mrs. Strickland walked, carrying her child, since the servant girl was too young to be of much assistance. The party averaged fifteen miles a day, and camped outdoors during two of the nights. At last on the morning of the sixth day the party arrived at Goderich with all members on the verge of exhaustion.

About the same time the first stages made their appearance on the Talbot Road. In 1827 a St. Catharines physician was given the exclusive right to operate a stage from Ancaster to Brantford, Burford and Delaware, thence to the Detroit River, for a period of 21 years. At first four-horse stages were used on the route, but lack of patronage soon reduced the equipment to an uncovered wagon. After a short time even this modest service was suspended and for some years there were no stages running over the whole route from Lake Ontario to the Detroit River. The stage line still continued to operate, however, between Hamilton and London, the fare being \$4.50. Some idea of the service may be gained from the fact that during this period it required two days to make the journey from York to London. It was not until 1835 that through coaches from Hamilton to the Detroit River were again in operation.

Throughout this period the normal conveyance, while graced with the name "coach", was usually a wagon. The four wheels were fitted with narrow tires and fastened to the body of the wagon without springs. The body itself was constructed of long boards shaped into a box while two seats rested on the sides. As a rule the seats had no backs and were covered with a sack of hay or a buffalo hide as a cushion. In winter, the open sleigh replaced the wagon, and the traveller covered himself with warm clothing and buffalo robes.

In addition to carrying passengers, the stage-coaches performed the important service of carrying the mail and transporting valuables from place to place. As a result

attempts to rob the mail-coaches occurred from time to time. In 1821 the York mail-stage was robbed and other unsuccessful attempts were made as time progressed.

This unpleasant situation placed a premium on stage drivers who were handy with their fists. In fact, the drivers mostly highly valued and highly paid by the stage lines were men who had gained at least a local reputation as rough-and-tumble fighters. Many of the drivers were also formidable drinkers and enjoyed a round of drinks at every stopping place along the route. As a result, drunken drivers were not uncommon, with consequent menace to passengers and other travellers alike.

The coaches could average from thirty to seventy-five miles in a day, depending on the route travelled and weather conditions. Emergencies such as broken wheels were frequent and led to long delays and uncertain schedules. In 1828, however, the trip from Montreal to Bytown (Ottawa) could be made in two days, while it required five or six days to travel between Toronto and Montreal.

About this time, the turnpike road was introduced into Upper Canada. In 1826 the Talbot Road was turnpiked—a method by which the roadway was ploughed and resultant earth scraped to the centre. This led to a much better surface than that provided by the corduroy road, although the problem of mud was not overcome until the practice of putting gravel on the surface was adopted.

Turnpike or toll roads soon became common throughout the province. Toll was charged for every vehicle using such roads, while in some cases pedestrians and even animals driven along the turnpike were charged a fee. In spite of the fact that the joint-stock companies were supposed to maintain the roads in return for the right to charge toll, most of the highways remained in wretched condition. No attempt was made to prepare the road-bed beyond the use of gravel on the surface when convenient. In fact, in 1832 one writer observed that the only piece of “gravelled hard-made road” he had seen for some years was the main street of York.

Toll gates, however, were erected every four or five miles. One contemporary writer summed up the situation when he declared that there was no "stronger instance of the patience and law-abiding disposition of the people than their toleration of so great an imposition as most of the toll roads of Upper Canada."

One of the main problems of transportation by road in the 1830's, however, was the bridges. Made of logs and put together without engineering skill, the bridges across many of the streams were a real challenge to the timid traveller or the uninitiated. One traveller, following a journey along the St. Lawrence River in 1833, wrote that "the wooden bridges across brooks and ravines appeared to my unpractised eye to be almost impassable. My fellow-travellers, however, (an amiable young lady included), testified neither surprise or alarm, and, of course, it did not become me to complain. The planks of the bridges were frequently so loose, so rotten, and so crazy, that I am yet at a loss to conjecture how our bulky machine and the four high-mettled steeds escaped without falling through."

In spite of these difficulties, gradual improvement in road travel came about as a result of covered stage-coaches replacing the open wagon. The man most responsible for the improvement was William Weller, one of the most famous stage-operators of his day. In 1830 he operated coaches from York to Carrying Place twice a week, while in 1835 he began a daily service between York and Hamilton during the winter months, following the route of Dundas Street.

The coaches operated on Weller's Royal Mail Line were the finest in the country. They were covered vehicles painted in bright colours with the King's coat-of-arms on the sides and drawn by four spirited horses. The coachman sat on a seat on the top of the coach, above the horses, and gave lusty blasts on his horn as the vehicle approached each stopping place along the route.

Through the enterprise of its owner, the Weller Line of stage-coaches soon extended from Hamilton to Montreal with numerous branch lines. Coach-houses were arranged for along

the route at intervals of about fifteen miles where the horses were changed, while inns were frequent where passengers could alight and refresh themselves during the journey.

Stiff competition, however, was provided by the ships travelling along the St. Lawrence and Lake Ontario, with the result that most stage-lines operated only in the winter months after navigation was closed.

A revolutionary change in road-building occurred in 1835-36 when the first plank road in North America was built east of Toronto. Such roads were soon quite common throughout the province, and in 1841 were introduced in Lower Canada when the road from Longueuil to Chambly was planked. The plank roads excited the admiration of travellers who had become accustomed to corduroy or turnpiked roads. One traveller from abroad indicated that "the best throughfares were the plank roads, which I never heard of till I reached Canada," while another reported that he had travelled on a plank road that was "as smooth as a billiard table".

The planks, which averaged four inches in thickness, were laid cross-wise and since materials were plentiful and little skill was required, the building of a plank road was quickly accomplished. It soon became apparent, however, that they provided no permanent solution to the problem of road-building since rain, mud, and frost played havoc with the planks when the foundation was soft, and constant repairs were necessary.

In 1837-38 a new method was introduced in highway construction when the section of the main east-west highway from Kingston to Napanee was macadamized at a cost of over \$130,000. This employed a means of hard-surfacing the road which had been developed in England by Macadam, one of the foremost road-builders of his time. About the same time, some twelve miles of Yonge Street leading north from Toronto were also macadamized. With these exceptions, however, the condition of roads in Upper Canada generally was bad and prompted one observer to declare that there were no roads worthy of the name in the province.

Mrs. Anna Jameson, who travelled extensively throughout the province in 1836-37, left a vivid account of road travel at that time. Speaking of a journey from Niagara to Toronto, she remarked that "Now, as we had heard, the navigation on the lake had ceased, and we looked for nothing better than a further journey of one hundred miles round the head of the lake, and by the most execrable roads . . .". She further indicated that "the only road on which it is possible to take a drive with any comfort is Yonge-street, which is macadamized for the first twelve miles." Dundas Street was described as "a very rough road for a carriage."

In the summer of 1837 Mrs. Jameson took a trip through the western part of the province with a view to visiting Colonel Talbot, the founder of the Talbot settlement. Her description of the journey from Brantford to Paris and thence to Woodstock leaves nothing to the imagination. ". . . The roads were throughout so execrably bad, that no words can give you an idea of them. We often sank into mud-holes above the axletree; then over trunks of trees laid across swamps, called here corduroy roads, where my poor bones dislocated. A wheel here and there, or broken shaft lying by the way-side, told of former wrecks and disasters . . . I have never beheld or imagined such roads. It is clear that the people do not apply any, even the commonest, principles of road-making; no drains are cut, no attempt is made at levelling or preparing a foundation . . .".

Arriving at length at her destination (Port Talbot), Mrs. Jameson had praise for her host. She remarked that "he has now the pleasure of contemplating some hundreds of miles of the best roads in the province . . ." and that "the Talbot road, carried directly through the town (St. Thomas) is the finest in the province."

However, all of the beauties of travel by road in Canada at this time were not lost on Mrs. Jameson, for she took particular note of the sleighs that were used in winter, and remarked, "I stood at my window today watching the sleighs as they glided past. They are of all shapes and sizes. A few

of the carriage-sleighs are well appointed and handsome. The market-sleighs are often two or three boards nailed together in form of a wooden box upon runners . . . others are like cars, and others, called 'cutters', are mounted on high runners, like sleigh phaetons; these are sported by the young men and officers of the garrison, and require no inconsiderable skill in driving . . . but the wood sleighs are my delight: a large platform of boards is raised on runners, with a few upright poles held together at top by a rope, the logs of oak, pine and maple, are then heaped up to the height of six or seven feet. On the summit lie a couple of deer frozen stiff, their huge antlers projecting in a most picturesque fashion, and on these again, a man is seated with a blanket around him, his furred cap drawn down upon his ears, and his scarlet woollen comforter forming a fine bit of colour. He guides with a pole his two patient oxen, the clouds of vapor curling from their nostrils into the keen frosty air."

At this time the expansion of settlement brought about the construction of a number of "colonisation" roads. Mention has already been made of the Talbot and Huron Roads that were built to encourage settlers to take up land in the regions through which they passed. Among these new colonization roads were Hurontario Street, running in a north-westerly direction from Port Credit to Collingwood on Georgian Bay; Garafraxa Road, or Rankin's Road, from Oakville to Owen Sound; and the Sydenham Road from Arthur in Wellington County to Owen Sound.

The usual custom in the construction of these colonization roads was to let contracts covering stretches of the road varying from one-half mile to two miles in length. The road was to be sixty feet in width and all stumps were left standing that did not interfere with the passage of traffic. In low or swampy places, causewaying was to be employed. Logs were laid across the road and as close together as possible, each log being at least sixteen feet long. Bridges under fifteen feet in length were included as causewaying. The

usual price included in the contracts for clearing the roadway was £23 to £25 per mile, while for causewaying the price was 7s.6d. to 10s. per rod.

After the Union of the Provinces in 1840, the trustees of the turnpike trusts in each district were instructed to set up a board of commissioners with authority to improve the turnpikes insofar as it was authorized by any Act of the Legislature. The commissioners were to receive no salary and could not be a party to any contract concerning the roads. They were to select an engineer to supervise the work, appoint toll collectors, determine the number of toll-gates to be permitted, and fix the rate of toll to be charged. Vacancies on the board were to be filled by the Lieutenant-Governor.

Such rapid progress in the development of roads took place in this period that by 1841 there were said to be nearly 6,000 miles of post-roads in Upper Canada alone. Upper and Lower Canada together had spent over \$2,000,000 on building roads and had guaranteed the interest on the obligations of numerous turnpike trusts.

Meanwhile, in Newfoundland, Sir Thomas Cochrane had become the first civil Governor of the Colony in 1825. He immediately set about organizing improvements in the Colony including the construction of roads in the vicinity of St. John's. During his tenure of office, which ended in 1834, roads were completed to Topsail, Bay Bulls, Torbay and Portugal Cove.

The wide use of the sea as a means of transportation in Newfoundland, however, made the construction and use of roads a matter of minor importance. It was much later before the development of roads throughout the interior of the Colony was undertaken.

The establishment by Samuel Cunard of a trans-Atlantic steamship service in 1840 did much to stimulate the use of roads in Nova Scotia. Halifax became the distribution point for mail destined not only for Nova Scotia, but the other provinces as well. Upon the arrival of the Cunard steamer a fast coach carried the mail from Halifax to Truro. At

this point another coach was employed to carry the New Brunswick mail from Truro to Amherst, while the first stage continued to Pictou with the mail destined for Upper and Lower Canada. By 1842 the Truro-Amherst coach extended its run to the New Brunswick border.

By 1850 stages ran three times a week from Pictou and Antigonish to Baddeck and Sydney. In fact there was no important community in the province that was not served by stage-coach at least twice a week. Inns and coach-houses were dotted along all routes where passengers could find refreshment while the horses were being changed.

At the same time travel between the provinces was also improved. Four times a week, a coach ran from Halifax to Saint John. It made the trip in forty-eight hours, although it had to run far into the night in order to maintain this schedule.

Between New Brunswick and Quebec the road was virtually impassable during the 1840's. It was not until 1851 that the journey from Halifax to Quebec could be accomplished by stage-coach.

New Brunswick had made great progress in the construction of roads. A report prepared by Professor J. F. W. Johnston for the Government of New Brunswick in 1849 showed 1,269 miles of great roads connecting the principal towns in the province. It indicated that over £150,000 had been spent in the construction of these main roads, while £10,000 a year had been expended on upkeep over the past fifteen years.

It was proposed in 1849 to build a further 830 miles of roads at a cost of over £50,000 with a view to giving the province a fine network of roads branching out in all directions from the main centres. In fact by 1850 New Brunswick had virtually completed the trunk roads in the province, and future years were spent in improving bridges, road surfaces, drainage, and grades.

Some regions where settlement was sparse, however, were not served by roads at all. In 1849, for example, if

travelling from the Saint John valley to the Bay of Chaleur it was necessary to make the greater part of the trip by canoe and spend five nights in the woods along the way.

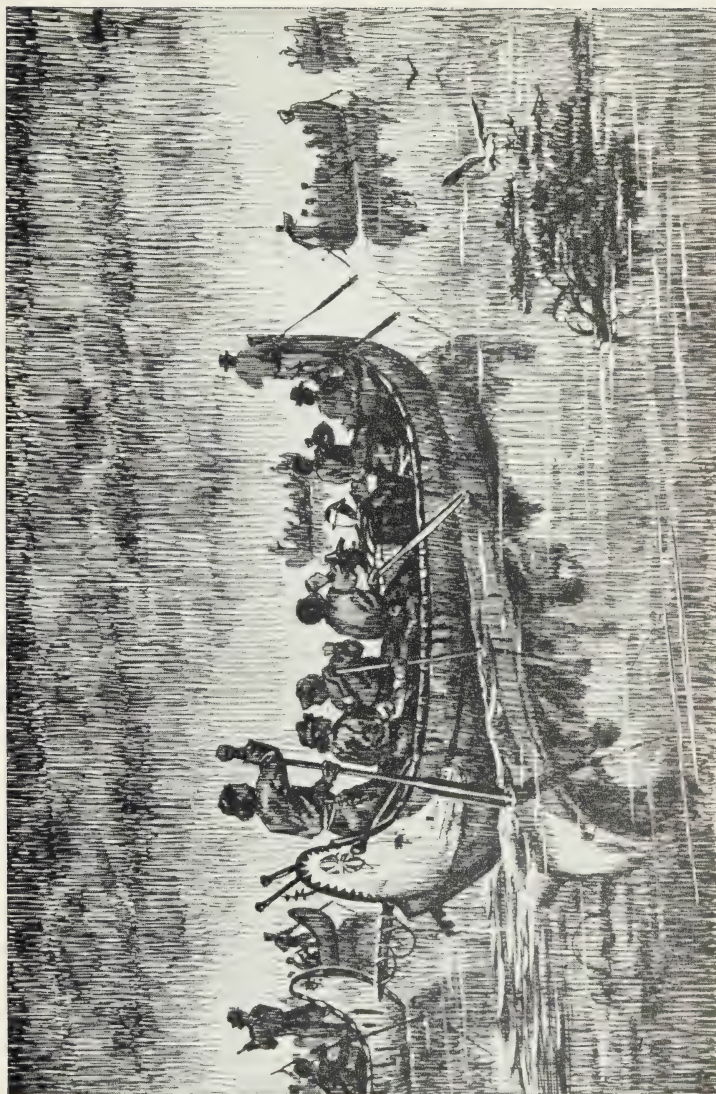
In Lower Canada the development of local roads linking new and old communities made steady progress throughout this period. Only one major road was undertaken in the 1850's—the Taché Road. This main artery provided an east-west route from south of Quebec City to the Kempt Road and about midway between the St. Lawrence River and the American boundary.

By far the greater part of the population, however, continued to depend on the mighty St. Lawrence River as a means of transportation and resorted to the roads only in winter when the footing was firm. In fact as late as 1851 the cost of food and fuel doubled in Montreal during the period when the ice was forming on the river.

As in Lower Canada, gradual progress was made throughout the 1840's in the development of roads in Upper Canada. By 1842 a daily line of stage-coaches operated across the province. In the early 1850's when coaching reached its peak, the main trunk line extended from Quebec on the east to the Detroit River on the west, with branch lines running off in all directions.

The passing of the Municipal Act in 1850 had a marked effect on the development of local roads. Municipal councils soon undertook to improve the roads under their jurisdiction. In Matilda Township in eastern Ontario, for example, the main road running north from the St. Lawrence River was planked by the council in the early 1850's. It was gravelled some eight or ten years later when the planks wore out. In 1875 a stone crusher was purchased by the township and that road, along with others, was macadamized.

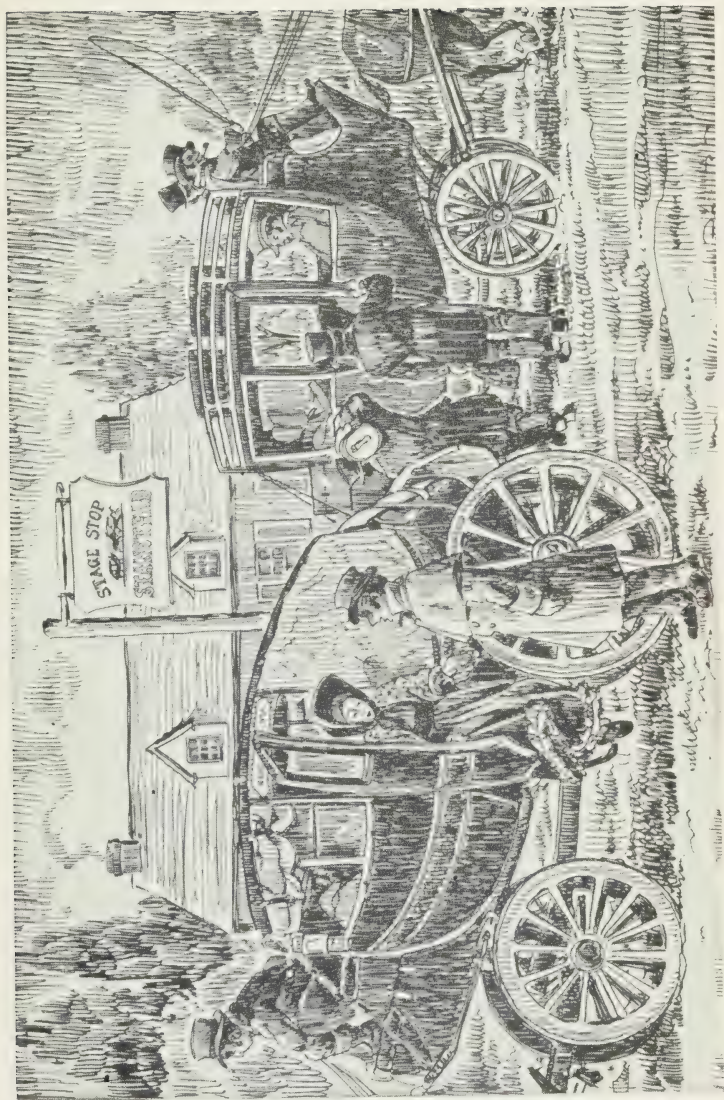
This development of local roads was duplicated by township councils throughout the province. The programme gained impetus after 1854 when the Clergy Reserves were sold and the money turned over to the local municipalities for general purposes. Some of the money at least was used



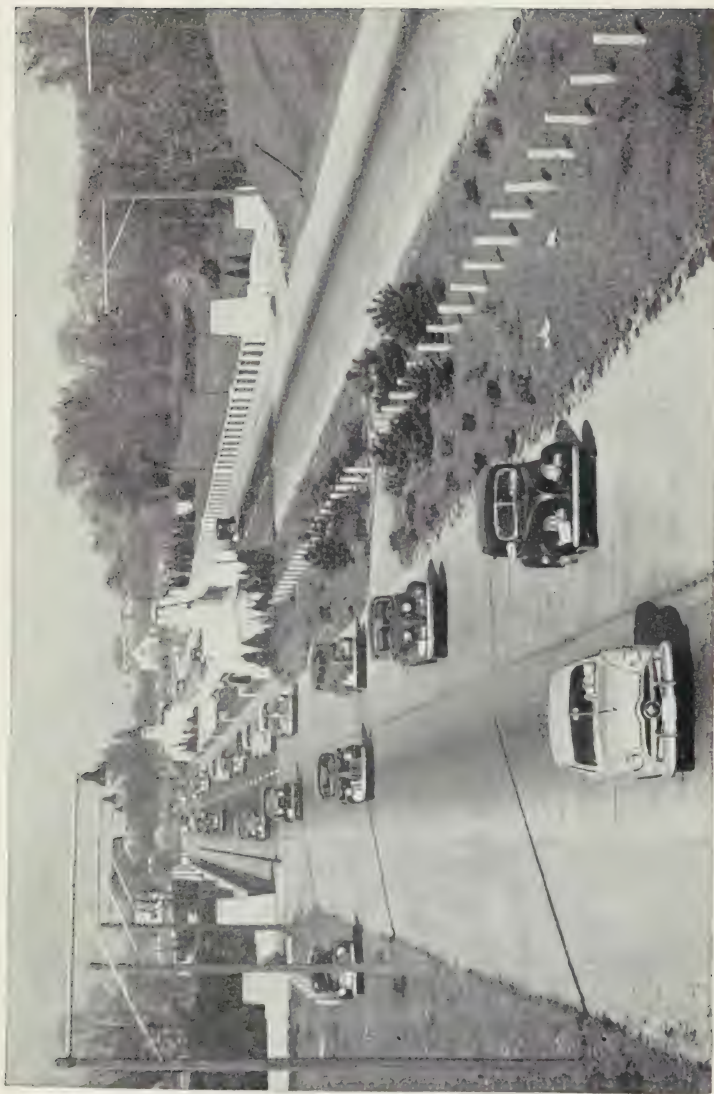
A "Brigade" of Canoes



Modern Lake Freighters



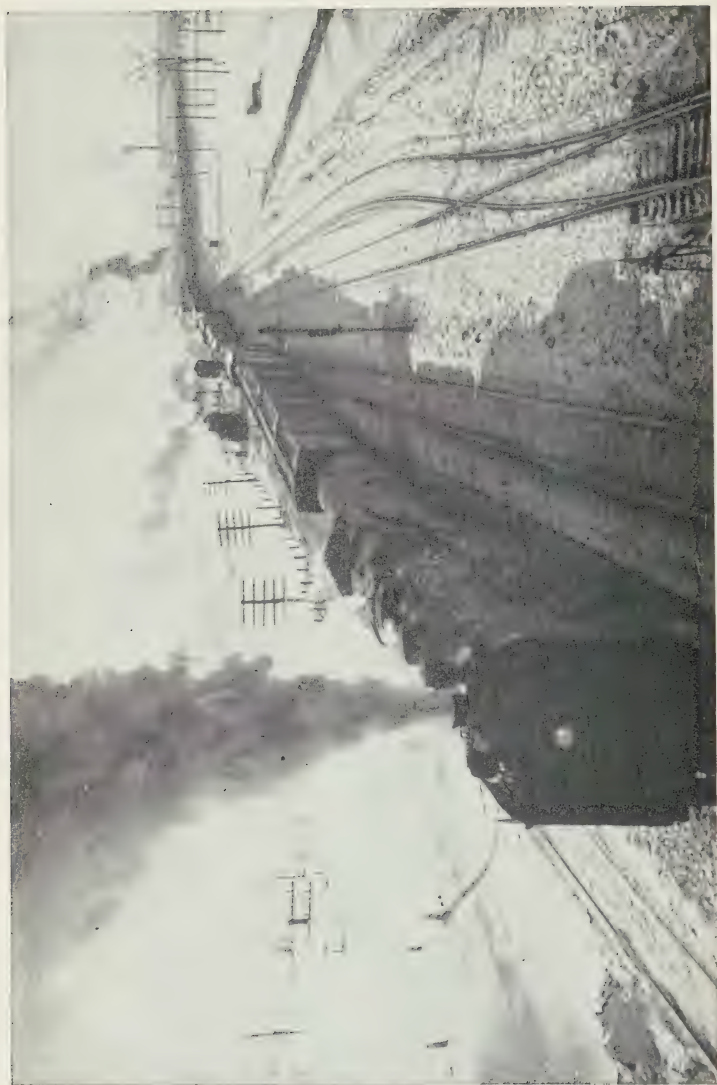
A Stage Stop in Lower Canada



A Modern Canadian Highway



FIRST STEAM RAILWAY TRAIN IN CANADA
ON THE CHAMPLAIN AND ST LAWRENCE RAILWAY, 1837
From a print in the Chateau de Kamegay



A Mile of Freight Train



"The Silver Dart."



A Canadian Jet Airliner

on road improvements. In addition, the townships had the right to erect toll gates and make use of the funds collected to maintain township roads.

In the 1860's the government undertook to build a number of roads in Upper Canada to encourage settlement in the "back" districts. Among these roads were the Ottawa and Opeongo Road which was to extend for 170 miles from the Ottawa River to Lake Huron; the Addington Road running northward for 61 miles from the settled areas of Addington County to the Opeongo Road; the Hastings Road, through the County of Hastings and connecting with the Opeongo Road; the Bobcaygeon Road running northward through Victoria County and intended eventually to reach Lake Nipissing; the Frontenac and Madawaska Road; the Muskoka Road from Lake Couchiching to the Grand Falls of Muskoka; and finally the Sault Ste. Marie Road from the Sault to Goulais Bay. As these roads were blazed, the new regions were opened to settlers, but the wilderness held back both road construction and settlement for many years.

In spite of activity in road-building throughout the provinces and the rapid expansion of settlement in all regions, the end of the stage-coach with its bright colours and spirited horses was slowly but surely approaching. From the outset, the coach had been forced to compete against the canoe, the bateau, the Durham boat, the sailing ship, and finally the steamboat. It was able to hold its own, however, since rapids and falls in many of the important rivers discouraged travel by water, while winter put an end to navigation and forced travellers to proceed by land if at all.

The death-knell of the stage, on the main lines at least, was sounded in October 1856 when the first railway train ran between Montreal and Toronto on the Grand Trunk Railway. Here was a stern competitor at all seasons of the year, and capable of speed that was far beyond the power of the finest span of horses. In addition, the comfort provided by the railway car was superlative when compared with the jolting and swaying of the finest stage-coach.

From this time, travel by road over long distances became less and less attractive. The rapid expansion of railways in the next twenty-five years did much to turn public attention away from roads and road-building. The highways retained their importance as connecting links between local communities but for journeys between the major centres in the provinces the railway was supreme. In fact, it was not until the dawn of the present century that the railway faced a competitor that was to do as much to revolutionize travel as the railway had done itself—the horseless carriage or motor car.

However, about the time railways began to exert an influence on land travel in the east, events in western Canada brought about the need for roads in these vast new areas.

In 1858 gold was discovered in the Fraser River area on the west coast and thousands of miners, prospectors and adventurers “rushed” into the region. The quest for gold soon changed Victoria on Vancouver Island from an obscure fur-trading post into a thriving town and the centre of great activities.

The British government took immediate interest in this new turn of events and on August 2, 1858 created on the mainland the colony of British Columbia. James Douglas who had been governor of the colony of Vancouver Island since 1851 became also the governor of the new colony. He was keenly interested in road-building, and during his tenure of office as governor of Vancouver Island had undertaken to develop a good system of roads in the southern end of the Island.

As soon as he became governor of British Columbia, Douglas turned his attention to the matter of roads. From time immemorial the Indians had had their own trails through these regions which had been widely used by the Hudson's Bay Company traders. They were never designed to carry the flow of traffic that now developed, however, as new gold strikes were made on the Quesnel and Horsefly Rivers. In 1860-61 gold was discovered in the Cariboo and the famous

“Cariboo Rush” of 1862 resulted. To meet the need for a trail into the area, Douglas began the construction of the Cariboo Road under the supervision of the Royal Engineers.

This wagon road was one of the finest achievements of the period in road-building. It was 485 miles in length and cost over \$1,000,000 to complete. The Yale-Cariboo wagon road from Yale to Clinton was 136 miles long, while the remainder of the road including the branch from Lillooet to Clinton was 349 miles. It required only two large bridges over the entire route and was a major feat of engineering even if judged by modern standards. As a means of paying for its construction, a toll was charged on all merchandise passing over the road.

Henceforth, persons going into the “gold” country could travel by a stage with six horses. Along the way road-houses provided refreshment for travellers and relays of fresh horses. Time for the journey was four to five days. Great loads of freight were drawn by bull-teams, but the miners still preferred to carry their provisions and supplies on pack-horses and mules. One ambitious packer brought twenty-one camels into the area as pack animals. The experiment was not a success since the sight of a camel promptly caused horses and mules to stampede.

The building of the Cariboo Road made access to the gold fields much easier for prospectors and adventurers. It also provided an easy way to the “outside world” for thousands who suffered disappointment in their search for riches. While there were probably twenty thousand men in the Cariboo in the winter of 1863 there were less than five thousand in 1871.

Douglas continued to demonstrate his interest in road-building. The Similkameen road from Hope was undertaken at this time as well. It was intended to be a toll road to Kootenay and eventually across the Rockies. Only twelve miles were built, however, since funds for its further construction were not available. It was later extended to Skaget Flat where there was a trail leading to Princeton.

In 1865 Edgar Dewdney continued this trail across the southern portion of the province to Fort Still. Known ever since as the Dewdney Trail, this road provided a route into the Kootenay and was widely used before the arrival of the railway. It followed the route proposed by Governor Douglas who had envisioned a road through the mountains to join a similar road from the east at Edmonton to form a great trans-continental road.

Many stirring events were to take place in Canada, however, before such a trans-Canada highway was to become a reality. Between the roads of Upper Canada and the Dewdney Trail in British Columbia lay thousands of miles of territory that had still to be settled and developed before road-building became either practical or necessary.

For two centuries, the Hudson's Bay Company had operated its trading posts throughout the vast regions west of Lake Superior. While the fur-traders for decades used the rivers almost exclusively as a means of transportation, the horse, and finally the Red River cart, gradually came to be popular with travellers journeying across the broad reaches of prairie land.

The nomadic Indians on the western plains had been in possession of horses as early as 1682 when Tonty saw them on the lower Missouri. By the middle of the eighteenth century they were common among the prairie tribes, although the Indians had no vehicles of any sort except the "travois", a triangular frame made of two poles, the ends of which dragged on the ground behind the horse while the upper tips were lashed over the back of the animal. A cross-bar a short distance above the ground provided a perch on which burdens could be carried. The horse made it easy for the Indians to follow the buffalo herds on which they depended for their food supplies, while the "travois" was of great assistance in bringing the meat back to their encampments.

The appearance of the Red River cart brought about a revolutionary change in land travel on the prairies. The first mention of the cart is to be found in the Journal of

Alexander Henry for the year 1801, where it was noted that "men now go for buffalo meat with small, low carts, the wheels of which are one solid piece sawed from the ends of trees whose diameter is three feet. These carriages are more convenient and advantageous than horses and the country being so smooth and level, we can use them to go in all directions."

As time progressed, the use of the Red River cart became so widespread among traders and residents of the various posts that "trains" of carts journeyed from place to place at frequent intervals. With the carts as a means of transport, hundreds of buffalo could be slaughtered on one hunting expedition and the meat readily conveyed back to the posts for preservation and storage.

Every summer hundreds of carts set out from the Red River Settlement and Pembina for other parts of the northwest. In 1844 the first cart train proceeded from the Red River to St. Paul—a journey that required up to two months to make. By 1854 there were fifteen hundred carts travelling to St. Paul from the Red River Settlement alone. Four years later there were six thousand carts being sent south annually from the Settlement and Pembina.

There were no roads as such across the prairies. Horsemen and carts followed well defined trails, many of which had been in existence for hundreds of years. The level nature of the ground and the lack of forests made it easy to proceed in almost any direction, although there were other hazards to be met. The crossing of rivers and streams presented great difficulty at times, while the hostility of some of the Indian tribes made it unwise for travellers to proceed through some regions except in force.

A journey across the plains and mountains to the Pacific coast was an undertaking of major proportions and required elaborate preparations. In 1862 Viscount Milton and W. B. Cheadle left Fort Garry on August 23rd for the west coast. Equipped with extra horses and a train of Red River carts which carried their baggage and supplies, and accompanied

by a number of half-breed guides, the party passed through Portage la Prairie and Fort Ellice and finally reached the valley of the Saskatchewan. They spent the winter in a home-made cabin at La Belle Prairie near Carlton House. When spring approached, the party made preparations to resume their journey. In their account of this part of the trip, Milton and Cheadle indicated that "the first thing to do was to find the horses, which had been turned loose at the commencement of the winter. We had seen them or their tracks from time to time, and knew in what direction they had wandered. LaRonde (one of the guides) followed their trail without difficulty, and discovered them about eight or ten miles away."

While the party made good progress after leaving winter quarters, the rivers presented a major obstacle—"We generally adopted the plan of making a small raft, on which one of us crossed; then, with a rope from either bank, we hauled the raft backwards and forwards, until the baggage was all ferried over. The horses were made to swim the stream, and the carts dragged across. This we found rather miserable work, standing up to our knees in the icy water, sometimes in the chilly evening, or the raw cold of early morning." The travellers encountered only one bridge in the whole of the Northwest Territory.

Nor were the hazards of the trail the only ones that had to be overcome. The Indians were definitely unfriendly and precautions had to be taken to avoid encountering large bands. In one instance a stage had been attacked by the Sioux, the driver and passengers scalped, and the wagons dumped into the Red River. Horses purchased from the Indians also had to be closely guarded since "It is common enough for them to repent having parted with their horses, and ease their minds by again taking possession of their former property."

After leaving Edmonton, the party faced the major test of the journey, for ahead lay the mountains. Some idea of the preparations necessary for such a trip may be found in the

following extract from the record of Milton and Cheadle. "We had twelve horses, six of which carried packs. Our supplies comprised two sacks of flour, of a hundred pounds each; four bags of pemmican, of ninety pounds each; tea, salt and tobacco. These last were the only luxuries we allowed ourselves, for as we could obtain no provisions or assistance until we reached some post in British Columbia, 700 or 800 miles distant, we sacrificed everything to pemmican and flour."

It was expected that the journey would take about fifty days, but it was four months later when the party staggered out of the wilderness near Kamloops—more dead than alive. The story was one of untold hardship, while death by starvation was only averted in the last part of the trip by killing the horses for food. It was almost a year to the day since the party had left Fort Garry (Winnipeg).

Such were the conditions of land travel across the western regions of Canada less than one hundred years ago.

Confederation in 1867 had one main effect on roads and road construction. While the building and maintenance of roads were regarded as the responsibility of the respective provinces, the new federal government did accept responsibility for some of the major connecting roads. These roads, such as the Temiscouata and Metapedia roads from Quebec to Halifax, were taken over as federal public works in the interests of national defence and immediate steps were taken to complete and maintain them.

In 1868 the Dawson road from Prince Arthur's Landing (now Port Arthur) in Ontario to Fort Garry (now Winnipeg), Manitoba was commenced. It was named after S. J. Dawson, the surveyor who was appointed by the federal government to explore the country west of Lake Superior and open up the route.

By 1869 the trail had been blazed for a distance of forty-eight miles from Thunder Bay at the head of Lake Superior to Shebandowan Lake. In the following winter bridges were built over the two largest rivers, while the road was pushed

an additional seven miles in the spring of 1870. Great difficulty was experienced, however, in keeping the road open, for many sections were washed out by spring floods, while forest fires were a constant menace. However, in the first year some six hundred immigrants travelled over the trail on their way to the prairies.

The Canada Year Book of 1872 indicated, however, that the Dawson Trail was "now a permanent work and regularly used for traffic." Known for decades as the "Grand Portage", the Dawson route extended for a total of 433 miles of which only 137 miles were on land and the remainder navigable water.

The admission of Manitoba to Confederation in 1870 and talk of a trans-continental railway encouraged settlers to look towards the vast, open plains west of Lake Superior with eager eyes. By 1872 there was a steady movement of people to Fort Garry over the Dawson route and the federal government was giving it a good deal of attention. Grant, who accompanied Mr. Sandford Fleming over the route in 1872, was not impressed by the possibilities of the Dawson trail as a means of solving the transportation problem from Port Arthur to Winnipeg. He remarked rather pointedly, "But as a route for trade, for ordinary travel or for emigrants to go west, the Dawson road, as it exists today, is far from satisfactory . . . This year about 70 emigrants have gone by the road in the six weeks between June 20th and August 1st. The station-masters and other agents on the road, as a rule, do their very utmost . . . but the task given them to do is greater than the means given will permit. The road is composed of 15 or 20 independent pieces; is it any wonder if these often do not fit, especially as there cannot be unity of understanding and of plan, for there is no telegraph along the route and it would be extremely difficult to construct one."

A considerable amount of space in the Year Book of 1874 was devoted to the improvements made on the route—"On the Red River route (Dawson trail to the Red River) 3 additional steam-launches were built at Collingwood, and one of

them placed on Shebandowan Lake, and the others on Lac des Mille Lacs, and Lake of the Woods. Twenty horses with the necessary outfit of wagons, etc. were purchased and placed on the Lake of the Woods road. Where (no) steam launches were ready rowboats were placed, and arrangements made to forward 50 or 60 immigrants daily . . . Buildings for the accommodation of Emigrants have been erected at Thunder Bay, Shebandowan, Kashaboiwe and Height of Land, and Huts for the same purpose at Mattawin, Baril and Brule stations. On the Lake of the Woods Road there are good houses at 4 places from 14 to 28 miles distant from each other. Arrangements have been made for putting up suitable houses at other stopping places, and a small steam saw-mill put up in operation, that material may be more quickly and cheaply provided."

Meanwhile, the development of railways in the east was having a disastrous effect on the stage-coach. By 1870 almost all of the main stage lines had been abandoned in Quebec and Ontario. The operators turned to local traffic and the side roads where the railways had less effect.

From this time, the construction of roads in the various provinces followed the course of settlement. New roads such as the Quebec-Lake St. John road built in 1871 came into existence to serve new localities with the result that a network of local and connecting roads gradually expanded. Many of them were, however, in indifferent condition and almost no roads were fit to travel on at all times of the year. Even the main provincial roads were unfit for use during the period of the spring floods.

One of the great difficulties remained, as always, the lack of good bridges in every province. A visitor to Ontario in 1882 observed that "there is a great want of good bridges in every part of the province. There are a few good substantial wooden frame ones built of late; but there are numbers of logs, some of which are nuisances—it is at the risk of the neck to ride over them . . .".

A good many of the bridges, particularly in Quebec, were covered. The roof helped to preserve the timbers and flooring of the bridge, while in winter it prevented snow from piling up on the structure.

Iron highway bridges gradually made their appearance throughout the country. The first one in Nova Scotia, for example, was erected at Argyle in Yarmouth County in 1879. The bridge itself had been made abroad.

Land travel on the prairies in the 1870's and 1880's followed much the same course as it had in the eastern provinces a few decades earlier. The saddle horse was followed by the team and wagon which in turn was succeeded by the stage-coach. The first stage was introduced into Alberta in 1883 by Captain Jack Stewart, a rancher from Pincher Creek. Although the vehicle was intended for his own use, it attracted so much attention that others soon followed his example and the first stage lines were begun.

While travel on the flat prairies was relatively uneventful in dry weather, a heavy rain presented problems in transportation that were not to be treated lightly. Referring to the streets of Winnipeg following a heavy rain in 1883, Fleming remarked, "Roadways, without paving or metal, in the newest of cities (Winnipeg), formed only on the deep, black, vegetable soil of the locality, are the least fitted to undergo an ordeal such as that of the last fifteen hours . . . I could only compare the thoroughly saturated, deep, black, vegetable soil to treacle, and the horses had to do their utmost to draw the load through it. The wheels were often axle deep, and the vehicle cracked, from time to time, as if it were going to pieces."

Such ordeals, however, were commonplace for the hardy settlers who fanned out across the prairies. They followed old and new trails beyond the settled regions and established new centres that gradually developed into flourishing towns and cities.

It must be remembered that throughout this period the chief emphasis was on the building of railways, and the construction and upkeep of roads was regarded as a secondary consideration to be left in the hands of local officials.

The sad state of the roads in Ontario in 1894 led to the organization of the Ontario Good Roads Association. The main objective of the Association was to interest the general public in the need for better roads. At the request of the organization, the government of Ontario appointed a Provincial Instructor in Road-making who reported in 1898 that "it is doubtful if there is a mile of true Macadam road in Ontario outside a few towns or cities. There are miles of road which are covered with dirty gravel or rough, broken stone, and are popularly supposed to be macadamized. Today the majority are little better than trails. From the middle of October until the end of December, and from the first of March to the end of May, a period of five months, by far the greatest part of the mileage of the province is mud-ruts and pitch-holes. There are at least two months when the roads are practically impassable."

An event that passed practically unnoticed when it occurred in 1896 was soon to bring the matter of roads sharply to the attention of the people and governments alike. In December of that year a "motor carriage" appeared on the streets of Toronto. Within two years the Provincial Road Instructor was prompted to prophesy that "motor carriages may be seen on the streets of the larger cities, and present indications are that they will become an important means of travel and communication." Subsequent events were to prove that the statement was not ill-founded.

The invention of the horseless carriage was to prove the first serious challenge to the supremacy of the railways in half a century. As more and more of the motor carriages made their appearance, the public demand for improved roads increased.

With the opening of the twentieth century, the administration of roads remained in the hands of local authorities. Roads were built by the townships or private companies,

while maintenance was taken care of through statute labour. The motor car, however, caused provincial authorities to devote more attention to the possibilities of travel by road and to assess their responsibilities in this direction. Ontario was the first province to take action when it passed the Highway Improvement Act in 1901. This Act provided the sum of one million dollars per year as a government subsidy towards the improvement of roads in the organized counties. The money was to be paid as one-third the cost of the completed work—provided the road was built according to government standards.

At first the motor car was regarded as a novelty. Numerous protests were soon raised, however, by irate travellers who claimed that these wretched machines were a public menace since horses had a great tendency to bolt as soon as one snorted into view. Progress was steady, but slow. In 1904 there were only 535 motor vehicles in all of Ontario.

The admission of the provinces of Alberta and Saskatchewan to Confederation in 1905 brought about important changes in the administration of roads in that region west of Manitoba that had previously been controlled by the federal government. The Northwest Territories had been surveyed already by the federal authorities and laid out in sections one mile square with the necessary road allowances. However, in many instances no road had actually been made, so that the new provincial governments now assumed responsibility for a veritable network of existing and projected roads and highways criss-crossing the vast prairie regions.

By 1907 there were 2,131 motor vehicles registered in six provinces—Nova Scotia had 63, Quebec 254, Ontario 1,530, Saskatchewan 54, Alberta 55, and British Columbia 175. The other provinces had none registered, while Prince Edward Island had prohibited them altogether. By 1913 the number registered in Canada had risen to over 50,000.

By this time it was recognized that the motor vehicle was here to stay and the provinces became increasingly aware of their responsibilities in the matter of good roads. In 1913

a Highway Department was established in Ontario with its own minister. Increased subsidies were granted for the building of county and trunk roads, while in 1917 the government was empowered to take over any highway and to assume sole responsibility for construction and up-keep. By this means the modern system of provincial highways gradually came into being.

In the other provinces similar events were taking place. In Quebec, the provincial government made grants for the construction of county roads and began to take over toll roads from the private companies that had control of them. At the same time the Roads Branch of the Department of Agriculture was made into a separate department with its own minister.

The government of Manitoba passed the Good Road Act in 1914, which was designed for the purpose of helping and encouraging rural municipalities in the development of a system of market roads and highways in the province. The Act, which was to be administered by a Good Roads Board, provided for government assistance to the extent of 66 $\frac{2}{3}$ % on provincial aided roads, 50% on gravel market roads, 33 $\frac{1}{3}$ % on earth market roads, and 50% on permanent bridges and structures.

The federal government also increased its participation in the construction of roads. In 1919 the Canada Highways Act was passed which authorized the spending of \$20,000,000 on the construction and improvement of highways over a period of five years. A minimum grant of \$80,000 was to be made annually to each province, while the remainder was to be allocated on the basis of population. At the same time the Department of Railways and Canals established a new branch to deal specifically with highways.

By 1917 there were over 197,000 vehicles registered throughout Canada, and all the provinces began to give serious attention to the development of highways that were adequate for motor traffic. The need for traffic laws was also recognized by the provincial authorities and such matters

as speed received early attention. In 1917, for example, the public was forbidden to operate motor vehicles in Prince Edward Island on Sunday between 9 a.m. and 1 p.m. and between 6 p.m. and 9 p.m. The speed limit in cities, towns and villages was $7\frac{1}{2}$ miles per hour, while 15 miles an hour was the limit in open country. In the other provinces the speed limit varied from 15 to 25 miles an hour, with Saskatchewan taking the additional precaution of limiting speed to 7 miles an hour when a car was meeting a horse.

A major development in the field of transportation by road took place about this time. It was not long after the introduction of the motor carriage before enterprising persons realized its possibilities in the field of freight and passenger haulage. The Canada Year Book of 1921 quoted a "recent government report" which stated that "the automotive transport industry is just beginning to be a factor in the transportation of passengers and freight in this country. Railways have found that the handling of less than car-load lots of freight is often unprofitable business; it follows that commercial trucks are being used in greater numbers to carry lighter shipments of property between some of the larger cities served by adequately surfaced highways."

By 1921 the number of motor vehicles in Canada had risen to 465,378 of which 32,889 were listed as commercial cars or trucks. About two-thirds of the commercial vehicles were in the province of Ontario where the trucking business got an early start. This was, in large measure, due to the existence in Ontario of highways suitable for trucking operations. In 1922 the province had 11,055 miles of waterbound macadam road out of a total of 12,998 miles of such road for the whole of Canada. It is interesting to note that in that year Saskatchewan was shown as having 135,010 miles of roads or nearly one third of the national total of 422,942 miles. Some 125,000 miles of Saskatchewan roads, however, were listed as unimproved earth roads that required little time or effort to construct or maintain across the flat prairie land.

In the same year Canada ranked second only to the United States in the number of registered motor vehicles. There was one motor vehicle for every 17·45 of the population or one for every 3·8 families in the country.

By 1923 there were over 56,000 commercial vehicles in use, or one out of every ten motor vehicles in Canada. Truck owners, often with only one or two vehicles, began to organize and develop freight services between the major cities of the country. Smith Transport of Oshawa, Ontario, now the largest trucking company in the British Commonwealth, is a striking example of the spectacular expansion that took place at this time in the highway transport business. Starting quite by accident when he was asked to transport some pianos from Oshawa to Toronto in 1919, Mr. Philip Smith saw his highway freighting business grow to such an extent that within seven years his fleet of trucks had increased from three to one hundred and fifteen vehicles.

About the same time, bus companies were established for the conveyance of passengers between the larger centres. One of the earliest of these was the Brewster Transport Company at Banff in Alberta, which began operations in 1914. By the end of the 1920's many of the major bus companies of Canada were established, and expansion was rapid.

The most widespread use of the motor vehicle, however, was in the field of personal or family transportation. By 1930 there were over 1,000,000 passenger cars in use throughout Canada, representing one car for every 9·5 people in the country. In addition, there were 165,000 commercial cars and trucks. Unfortunately the increased use of motor vehicles brought in its wake a great increase in accidents and fatalities. In 1930 there were 1,290 persons who lost their lives as a result of highway accidents.

The phenomenal increase in the use of cars and trucks both for commercial and private purposes made the continued development of a good system of highways essential. All governments—federal, provincial, and municipal—shared in

this development, the funds coming in large measure from taxation on the motor vehicles themselves and from taxes on gasoline. In 1930 there were 394,352 miles of highway in Canada. In the same year the sum of \$69,998,233 was spent on roads by the various governments throughout the country.

In 1931 the federal government entered directly into the field of highway construction when it began to build a Trans-Canada Highway as a means to relieve unemployment and to permit travel by road from coast to coast on Canadian soil. It was years, however, before the Trans-Canada Highway was to become a reality.

Many of the provinces also undertook heavy programmes of highway construction and improvement at this time. One of the major undertakings was the construction of the Queen Elizabeth Highway from Toronto to Hamilton and thence to Niagara Falls. This four-lane highway was the first modern highway of its kind in Canada and was officially opened for traffic by Her Majesty, Queen Elizabeth, on the occasion of the visit of the King and Queen to Canada in 1939.

The outbreak of war in that year placed a great strain on transportation services in Canada. The vast expansion in all fields of production and the need to convey finished war materials, equipment and supplies to the ports was a challenge to freight carriers of all kinds. The highway trucking firms, large and small, made a major contribution in meeting the challenge successfully. This was done in the face of great loss of skilled drivers and mechanics who entered the armed services. In fact, it was estimated that twenty-five per cent of the truck drivers previously employed by highway transport companies went into the forces soon after the outbreak of hostilities. At the same time, the automotive industry produced thousands of motor vehicles for the armed forces of Canada and the allies.

One of the great achievements in road-building in Canada was the construction during the war of the Alcan Highway, later renamed the Alaska Highway. Built by the United States army and numerous contractors, the highway was

1,600 miles long of which 1,220 miles were in Canada. The southern terminus was at Fort St. John, B.C., thence northwards through Whitehorse in the Yukon to Fairbanks, Alaska. The building of the Alaska Highway was a remarkable engineering feat for it was begun in March 1942 and opened to wheeled traffic throughout its entire length in November of the same year. Following the war, the Highway was turned over to Canada and has since been maintained and developed by Canadian army engineers.

The war had brought general highway construction, and even maintenance, virtually to a halt, as men and materials were directed to the war effort. The close of hostilities in 1945 found all governments faced with the necessity of undertaking important programmes of road construction.

By the end of 1951 there were 567,155 miles of highways in Canada of which 166,899 were surfaced. In that year \$278,000,000 was spent on construction and maintenance, with \$249,000,000 coming from the provincial governments. At the same time there were 2,872,000 motor vehicles registered throughout the country, or double the figure in 1930. In addition, Canadian highways were carrying vast numbers of tourists' cars from the United States each year.

The admission of Newfoundland to Confederation in 1949 had little impact on transportation by road in Canada as a whole. There were 13,981 motor vehicles registered in the new province, but the lack of good roads, coupled with the fact that the people of Newfoundland are traditionally a seafaring people, reduced road transport to a position of minor importance.

The post-war years also witnessed a phenomenal rise in the production of passenger automobiles. As a result of the conversion of industry to war production, only 2,099 passenger vehicles were made in Canada in 1945. By 1950, the figure had reached 341,141.

The construction of a national highway from coast to coast was approved with the passing of the Trans-Canada Highway Act by the Federal Parliament in December, 1949.

Sections of such a road had been undertaken as early as the 1930's but no concerted effort was made to complete the missing links. Under the new legislation the Highway, estimated to be 4,933 miles in length, was to be built to prescribed standards. Each province was to construct and maintain that portion within its own boundaries, and also to determine the route of the Highway within its borders. It was understood that the most practical east-west routes were to be chosen and that the provinces would agree on locations where the Highway crossed provincial boundaries. The federal government was to reimburse each province for fifty per cent of the cost of new construction and a like percentage of the cost of highways already built that were taken into the plan. The contribution of the federal government was limited to \$150,000,000.

The actual work of construction was to be under the direct control of the provincial governments, while the federal Department of Resources and Development was to accept responsibility for the Highway from the national standpoint.

The Act stipulated that the Highway was to be completed by December 1956. All provinces except Quebec and Nova Scotia had signed agreements with the federal government by June 1950, and work had been undertaken amounting to \$11,200,000.

Since the war, motor buses and trucks have steadily increased in importance in the field of transportation. They provide passenger and freight service between many centres, some of which have no other facilities available. Some idea of the impressive increase in equipment, investment and volume of traffic is gained from the fact that investments in land, buildings, and equipment owned by motor-carriers rose from \$59,000,000 in 1945 to \$141,000,000 in 1950. The number of vehicles, including trucks, tractors, semi-trailers, trailers, and buses, increased from 13,025 to 30,771. Over 376 million passengers were carried in 1949, an increase of 140 million over 1945, while freight tonnage was over 15 million as compared with 11 million for 1945.

Today the motor vehicle plays a vital role in the life of the nation. Thousands of trucks and buses carry passengers and freight along the main highways of the country every day of the year. In winter millions of dollars are spent in snow-ploughing and removal so that motor traffic may not be interrupted. Millions of Canadians own cars that are used for business or pleasure. In fact, in 1950 there was a motor vehicle for every 5.3 persons in the country. Nor was the widespread use of the car or truck confined to the cities and towns for, according to census returns (1951), there were 525,789 motor vehicles in use on Canadian farms. It is indeed true that the motor vehicle and the existence of good roads have combined to overcome the vast distances to be found in Canada and to bring the people living in all parts of the country much closer together.

CHAPTER III

TRANSPORTATION BY RAIL

As outlined in previous chapters, the vital need for communication between centres of settlement in Canada gradually led to the development of transportation facilities by water and by road.

The invention of the steam engine, in due course, wrought great changes in the methods of travel, for it led to the development of the steamboat and locomotive. This, in turn, spelled the ultimate doom of the sailing ship and the stage-coach.

The first railways in Canada were built at Pictou and North Sydney, Nova Scotia, in 1827 and 1828 respectively. They were used for hauling coal from the mines. In the absence of other sources of power, the cumbersome wagons were pulled along the rails by sturdy horses. It is interesting to note that these coal railways were the first to adopt the standard gauge of 4 feet, 8½ inches, and were probably the first in America with all-iron rails cast in 5-foot lengths on the ground.

Public interest in railways was demonstrated about the same time when an agitation began in St. Andrews, New Brunswick, to have a railway using steam locomotives constructed between St. Andrews and the city of Quebec. Public meetings were held at various times between 1827 and 1837 to discuss the question of "a railway for waggons from Quebec to the harbour of St. Andrews upon the Bay of Fundy . . . a route which will convey the trade of the St. Lawrence in a single day to the Atlantic waters." Great progress was made on the plans and for a time it appeared that the railway would be built. In 1836 the legislature of Nova Scotia passed a resolution favouring the railway, while the legislature of New Brunswick passed an Act incorporating the St. Andrews and Quebec Railway Co. The British government, in turn,

granted £10,000 to be used in surveying the route. All of this came to nought, however, when the United States objected strongly to the proposed route of the railway in 1837. The British authorities gave orders that all work on the project was to cease until the boundary was settled. It was many years before the scheme was revived.

Meanwhile, in 1832 a charter was granted to the Company of Proprietors of the Champlain and St. Lawrence Railroad. There were seventy-four proprietors and the capital provided for was £50,000. It was the intention of the company to construct a railway from Laprairie on the St. Lawrence to St. John's on the Richelieu, a distance of sixteen miles. It was suggested that the cars should be pulled by horses and that such a railway would be of great value in spring and autumn when roads were impassable. A contemporary newspaper observed, in connection with the project, that the whole railway should be raised two feet above the ground so as to avoid the winter snow, and built as far as practicable in the direction of the prevailing winter winds.

In the Act of incorporation, the rates for both freight and passengers were laid down. The maximum rate that could be charged for the sixteen miles of the proposed railway was 2s. 4d. for passengers and 7s. 5d. per ton of freight per mile. If the dividends on the railway exceeded twelve per cent, the rates were to be correspondingly reduced.

A charter was also granted in 1832 for the building of the Cobourg railway in Upper Canada. It was to run from Cobourg to Peterborough and was to be used mainly for transporting lumber from the "back" districts to Lake Ontario. In 1834 a second charter was issued in Upper Canada for the construction of the London and Gore Railway in the southwestern part of the province. No further action was taken in either case, however, and it was some years before the railways were built.

Construction began on the Champlain and St. Lawrence Railroad in 1835, and such progress was made that the road was opened for traffic in July 1836. The gauge employed was

5 feet, 6 inches, while the rails were of wood, with thin strips of iron fastened on the top. These came to be known as "snake-rails" for they were apt to curl up with the heat of the sun.

At first, teams of horses were used to haul the four cars, but in 1837 the proprietors imported a steam engine, the "Dorchester", from England, along with an engineer. Trouble was encountered on the first run when the "Kitten", as it came to be known, refused to budge. An engineer from the Baltimore and Ohio Railroad declared that nothing was required but more wood and water. When these were applied the engine tore over the rails with its row of cars at the astonishing speed of sixteen miles an hour.

In 1839 a six-mile railway was built to carry coal from the Albion mines to Pictou Harbour in Nova Scotia. The opening of the road was observed with free rides for all, a great banquet and finally a grand ball. Three locomotives, the "Samson", "Hercules", and "John Buddle", the first coal-burning locomotives in Canada, were used to carry over one thousand visitors on the round trip. One of the locomotives, the "Samson", is still to be seen in the railway station at Halifax.

The first railway to be constructed in Upper Canada was a short portage railroad reaching around Niagara Falls from Queenston to Chippawa and known as the Erie and Ontario. The charter was granted in 1833 but it was 1839 before the line was actually built. The grades along the route were so steep that steam locomotives could not be used, so the cars were hauled by horses. Later the line was rebuilt from Chippawa to Niagara-on-the-Lake and steam locomotives were taken into use. From the outset, however, the Erie and Ontario proved to be valuable for transporting goods and supplies of all kinds between Lakes Ontario and Erie.

Although charters were issued for a number of projects in both Upper and Lower Canada during the period, nothing came of them. It was not until 1845 that railway building in Canada began in earnest. In that year a charter was granted

to the St. Lawrence and Atlantic, which was to connect at the American boundary with the Atlantic and St. Lawrence which was being built by American interests from Portland, Maine. This railway was of real interest to the residents of the Eastern Townships who felt that the lack of good roads was a hindrance to the marketing of their grain. Considerable difficulty was encountered in financing the scheme, but construction finally got under way. By December 1848 the line was open from Montreal to St. Hyacinthe, a distance of thirty miles. In that year, the finances of the company became critical, for the expenses of construction were very great, and for a time it appeared that the project might have to be abandoned. The enthusiasm of the citizens of Montreal for the railway remained undimmed, however, and in 1849 they undertook to provide £125,000 for the enterprise.

Some idea of the precarious state of the railway may be gained from an announcement that appeared in the Montreal "Gazette" on April 11, 1849. The advertisement stated that since it was necessary to overhaul the locomotives in preparation for the spring business, the cars would not run between St. Hyacinthe and Montreal for fifteen or twenty days, and that notice would be given of resumption of the service.

The limit had been reached in the private financing of the project and it was not until government aid became available that further progress was made in building the railroad.

Interest in railway building in Canada was not confined to the St. Lawrence and Atlantic. Residents of the city of Hamilton in Upper Canada were enthusiastic about the prospects of reviving the London and Gore railway with their city as the eastern terminus. The charter, issued in 1834, had been permitted to lapse. It was renewed in 1845 under the name of the Great Western Railway and strenuous efforts were made to raise the money with which to undertake construction of the line. In 1847 the ground was broken at London on the Great Western, which was said to be "the unfinished link in the greatest continuous chain of railway communication in the world." In spite of this splendid beginning, nothing further was done for several years.

In 1846 there was a total of 22 miles of railway in Canada, but public interest was keen and numerous ambitious projects were in the making. In that year the charter of the Cobourg railway was renewed, while in Lower Canada construction was begun on the Lachine portage railway. At the same time, instructions were given by the British Government to the Royal Engineers to commence a survey of the route of a proposed railway from Halifax to Quebec. When the report of the survey revealed that the cost of the line would probably be about £5,000,000 sterling, the project had to be suspended since the combined resources of the provinces involved were inadequate to carry on the work.

In 1847 the Lachine railway was opened for traffic from Montreal to Lachine. For the first year American locomotives weighing about eighteen tons each were used on the railway, and the journey of eight miles was completed in twenty-one minutes for a speed of almost twenty-three miles per hour.

On July 24, 1848, the "James Ferrier" made its initial trip over the Lachine railway. This locomotive was the first to be imported into Lower Canada from Great Britain and had been constructed in Dundee, Scotland. At this time the English style of compartment cars was used on the line, which provided for three classes of passengers.

Between 1834 and 1849 some seventeen railways had been chartered in Upper Canada, while an equal number had been chartered in Lower Canada. This extravagant chartering, which was rarely followed by any concrete action since funds were lacking, soon made the general public wary of "railway schemes". In fact, it came to be recognized that little railway building would be done in Canada unless government aid were forthcoming.

In 1849, steps were taken to provide such aid. The government of the united Canadas passed the Guarantee Act which guaranteed interest at six per cent on a sum not

exceeding one-half the bonded debt, in each case, of a railway that was over seventy-five miles long, and one-half of which was already constructed. Under this Act, railway building entered a new era. In 1850 there were sixty-six miles of railway in Canada. By 1860 this had increased to 2,065 miles, largely as a result of government aid.

One of the first projects to be commenced after the passage of the Act was the Ontario, Simcoe and Huron Railway, later renamed the Northern. The line was to run from Toronto to Collingwood by way of Bradford and Barrie, and was intended to carry transit trade between Lake Huron and Lake Ontario. The first sod was turned on the project in 1850, although it was not until 1853 that the line was operating over any of the route.

Under the Municipal Act of 1849, municipalities were permitted to take stock in, or lend to, road and bridge companies. At the same time legislation was passed authorizing the formation of joint stock companies "for the construction of roads and other works in Upper Canada". Under this legislation, the Great Western Railway had its charter amended so as to permit municipal subscriptions. By June 1851 stock subscriptions had been received from Oxford and Middlesex counties in the amount of £25,000 each, while the towns of Galt and London had produced similar amounts. In addition a further £100,000 was subscribed by the city of Hamilton. As a consequence, active construction on the Great Western began.

Other events in the development of railways also made 1851 a noteworthy year. At this time a controversy raged in railway and government circles over the gauge that was to be used. The Champlain and St. Lawrence had been built on a gauge of 5 feet, 6 inches. When the charter of the St. Lawrence and Atlantic was issued it called for a gauge of 4 feet, 8½ inches. This was later changed to 5 feet, 6 inches at the request of the company.

American railway lines employed a gauge of 4 feet, 8½ inches, and the Great Western wanted to use this gauge which would simplify the movement of through American freight from Detroit to Niagara Falls, which had been a major reason for the building of the line. The government insisted, however, that the gauge be 5 feet, 6 inches if financial assistance was to be expected. As a result the Great Western resorted to a third rail which enabled them to handle cars of either gauge. This "battle of the gauges" was to have a considerable effect at a later date, for the Grand Trunk was also constructed on the "broad" gauge and finally had to be converted to the standard gauge of 4 feet, 8½ inches at considerable expense.

At the same time construction on the St. Lawrence and Atlantic was proceeding. By 1851 the line had reached Richmond in the Eastern Townships, and Sherbrooke in the following year. By 1853 the railway was completed to the American border where it connected with the Atlantic and St. Lawrence from Portland, Maine. Great difficulties were created in the trans-shipment of goods, however, by the fact that the two lines used different gauges and freight had to be transferred from one set of cars to another at the border.

A further development came about as a result of the advice of Canadian financial agents in London. In 1851 the scope of the Guarantee Act of 1849 was restricted to the Great Western, the St. Lawrence and Atlantic, and the Northern railways since it was felt that without restriction the building of railways with government aid might be injurious to the public credit.

The charter issued to the Grand Trunk Railway in 1852 marks the beginning of railway building in Canada on a large scale. This line was to extend from Quebec city to Sarnia in Upper Canada and was to provide "through connections" from Lake Huron to the sea.

The legislation under which the Grand Trunk was chartered was centred in three Acts. The first of these made provision for the building of a railway from Toronto to Montreal. The capital of the company was set at £3,000,000, while provision was made for a government loan of £3,000 per mile. There were to be eighteen company directors, of whom nine were to be appointed by the government.

The second Act provided for the extension of the railway from Quebec to Trois Pistoles and under certain conditions to the eastern boundary of the province. The capital was set at £100,000 while the government grant of £3,000 per mile was to apply to the section of the line between Trois Pistoles and Quebec. If the railway was extended beyond the former point, there was to be a subsidy of 1,000,000 acres of land.

The third Act in the series dealt with the charters that had been granted in 1851 for the building of the Kingston and Toronto and the Montreal and Kingston railways. These railway companies had protested against the construction of the Grand Trunk as a direct violation of their charters. Notwithstanding such protests, it was now provided by legislative action that their charters were to be repealed, and the Grand Trunk was to reimburse the companies for expenditures already made.

Under the stimulus of financial aid from municipalities and the government, progress was rapid on the construction of railways in Canada. As indicated above, the St. Lawrence and Atlantic was completed in 1853. In that same year, the Great Western was opened from Niagara to Hamilton, and from Hamilton to London. By the following year the line was completed to Windsor. At the same time, the Northern Railway was in operation from Toronto to Bradford.

Until now, locomotives that were used on the various railways had to be imported from England. In 1853 the Toronto Locomotive Works turned out the first locomotive,

the "Toronto", to be built in Canada. Amid great public enthusiasm, the locomotive made its first run on the Northern railway on May 16, 1853.

Meanwhile, details concerning the proposed Grand Trunk Railway were issued in London. It was proposed to construct and operate some 1,212 miles of railway as follows:

Sarnia and Toronto.....	172 miles
Toronto and Montreal.....	345 "
St. Lawrence Bridge.....	2 "
St. Lawrence and Atlantic.....	140 "
Quebec and Richmond.....	100 "
Quebec and Trois Pistoles.....	253 "
Peterborough Branch.....	50 "
Atlantic and St. Lawrence (leased).....	150 "
<hr/>	
1,212 miles	

The directors of the Grand Trunk at once began to investigate the possibility of incorporating other railways with it. The object was to gain a share in the transportation of goods from the western United States. In 1853 an agreement was reached between the Grand Trunk, the Quebec and Richmond, the St. Lawrence and Atlantic, the Grand Junction, and the Toronto and Guelph to amalgamate, the line to be known as the Grand Trunk Railway of Canada.

The Great Western Railway sensed serious competition when the agreement was reached between the Grand Trunk and the Toronto and Guelph which was to be extended to Sarnia. Strong opposition to such a move was expressed by the directors of the Great Western, as it was seen as a threat to force amalgamation of that line with the Grand Trunk. A happy agreement was reached, however, in May 1853 whereby both companies agreed to co-operate against injurious competition and to oppose competing projects.

While these events were taking place in Upper and Lower Canada construction began on the European and North American Railway on the east coast. This line was to run

from Portland, Maine to Halifax in Nova Scotia, a distance of 550 miles. There was to be 204 miles of line in New Brunswick and 124 miles in Nova Scotia.

There was a considerable difference of opinion on the matter of private or public ownership. In New Brunswick, the province contracted to have their portion of the line built by a private firm with the government taking £250,000 of stock and lending £1,800 per mile secured by a first mortgage. In Nova Scotia public ownership was favoured.

Work commenced on the line in 1853 but, like many other railway enterprises of the period, the builders were soon in financial difficulties. By 1854 work had been stopped completely in Nova Scotia, while in 1856 the government of New Brunswick took over the work in that province and paid £25,000 to the contractors for the portion that had been completed.

In 1854 the government of Nova Scotia under the leadership of Joseph Howe began the construction of a railway from Halifax to Truro, with a branch line to Windsor. Later the line was extended to Pictou. While the mileage covered by the railway was not impressive, the line was important since it gave ready access to the Atlantic port of Halifax from the Bay of Fundy.

Considerable progress was made in railway building in Upper and Lower Canada during 1854. In that year construction of the Grand Trunk from Montreal to Toronto began, while lines were completed from Richmond to Levis, Cobourg to Peterborough, and from Ottawa to Lacolle.

The opening of the Cobourg to Peterborough railway was the occasion for a great celebration. The town of Peterborough had a banquet at which the directors of the company and fifty other gentlemen from Cobourg were honoured guests. The railway company offered a free ride to every person who wanted to make the trip and over a thousand people availed themselves of the opportunity to make the journey. Promptly at 10.30 on the morning of December 29th, 1854 the train left Cobourg with its crowd of happy passengers. The train of

twelve cars was pulled by "two powerful locomotives" and raced along at the impressive speed of over fifteen miles per hour.

In the same year the Great Western Railway began to carry mail on its trains between Niagara Falls and London. The plan of sorting letters on the running train was first put into action on the line at the same time, and P. Purdon was placed in charge of the mail car. Mr. Purdon was, in fact, the pioneer mail clerk of the North American continent.

With plenty of heavy timber readily available, the bridges on Canadian railways during the early years were entirely made of wood. The use of timber, of course, reduced the length of span that could be used while fire along the line was a constant source of danger. Sir Sandford Fleming, who was the chief engineer on the Intercolonial Railway, fought a strenuous battle to have iron bridges used in the construction of that line, and finally won. Construction was begun, however, in 1854 on the first outstanding iron bridges of Canada—the Victoria tubular bridge across the St. Lawrence River at Montreal. Although larger and more spectacular bridges were to come later, the Victoria Bridge was a great achievement and merited the praise it received.

As if to confirm the suspicions of a considerable number of people that no benefit could possibly arise from trains that raced across the countryside at such reckless speed, the first major wreck in Canadian railway history occurred in 1854. A gravel train that was hauling ballast for use in construction of the line collided with a passenger train on the Great Western Railway west of Chatham and forty-seven people were killed.

In spite of such tragedies, however, the work of constructing railways continued apace. In 1855 the Great Western completed its line from the Niagara River to Windsor, as well as the line from Hamilton to Toronto. The Grand Trunk line was open for traffic from Montreal to Brockville on November 19th of that year, while the road eastward from Quebec to St. Thomas, a distance of 40 miles, was in use for the first time on December 3rd, 1855. An important link

with the Canadian West was forged at the same time when the Northern Railway was completed from Toronto to Collingwood.

A great event in the history of Canadian railways was the completion and opening of the suspension bridge over the Niagara River in 1855. Built by John. A. Roebling, it was the first successful suspension bridge for railway traffic and presented a most impressive sight as it "hung" over the Gorge below the falls. The bridge was the connecting link between the Great Western Railway and American railway lines running south of the border, and was therefore an important factor in the movement of freight and passengers between the two countries.

Meanwhile work on the Grand Trunk was progressing. By the fall of 1856 the line was completed from Montreal to Toronto in spite of numerous difficulties. One of the major problems was the construction of a large viaduct at Port Hope which was named the Albert Bridge in honour of the Prince Consort. Requiring a great deal of engineering skill, the bridge was 1,856 feet long and was built on 56 piers. It was finally completed and opened for traffic on October 27th, 1856, when the first passenger train crossed the long span on its initial run from Montreal to Toronto. So great was public interest in the opening of this great trunk line of communication that the sum of £10,000 was raised by public subscription to meet the expenses of a celebration.

At this time some 850 miles of railway had been completed in the Grand Trunk system, including the Toronto-Guelph section that had been purchased and opened for traffic on July 1st, 1856, and the Guelph to Stratford line which was opened with a public holiday and a great celebration on October 8th.

It is interesting to note that the Grand Trunk was the first railway in North America to employ regular mail cars for the transmission of mail. At first regular baggage cars were

loaded with mail pouches and despatched as far west as Brockville. In 1854 the baggage cars were replaced by cars especially fitted up as mail cars. It was at least ten years before such cars were in service elsewhere on the continent.

In 1856, the Great Western was completed from Windsor to Toronto, so that it was now possible to travel by train from Quebec City to Windsor and Detroit, although such a long journey would have been a challenge to the hardest traveller since facilities were not conducive to comfort. The rails, which were hollow and stood less than four inches high, were made of iron and fashioned after an inverted "V". They were eighteen feet in length and were laid in such a manner that there was a considerable gap between adjoining rails. As a result, passengers were given a rousing jolt at regular intervals as the wheels of the car crossed the gap.

The locomotives were small and weighed some thirty tons. They burned wood, often green, and were equipped with four coupled drive wheels. The smoke stack was bell-shaped, and fitted with a screen to reduce the menace of sparks and cinders to passengers and property. Piles of cordwood were kept at every station and passengers often aided the crew in taking on a fresh supply.

The cars themselves were constructed of wood and had light four-wheel trucks. They were coupled together with link and pin couplings that gave a jolty motion to the train when stopping and starting, and were fitted with hand brakes. The brakes were crude in type and required great co-operation between the engineer and the brakemen before they could be successfully operated. At a designated sign-post or point about half a mile from a stopping place, the engineer would blow the "Down brakes" signal on the locomotive whistle. Numerous brakemen immediately rushed through the passenger cars or over the freight cars, to twist around the brake handles that soon came to be termed "Armstrongs". By this means the train was brought to a jerky halt, after which further twisting was necessary in order to release the brakes so that the train might start again.

Since the trains did not run at night there was, as yet, no need for sleeping accommodation, while meals were available at various stations along the route.

It was in Hamilton that the first sleeping cars in the world were made. A master painter for the Great Western named Whitton worked on the construction of the first of such cars, which was placed in operation in 1857. A model of this car was later sent to Great Britain and France. Plans for the sleeping car were developed by Samuel Sharp, the first master mechanic of the Great Western and the design was later copied by the Wagner Company and Pullman. The initial pullman sleeping cars appeared in 1859.

The first sleeping cars were, in fact, built like freight box cars that were fitted up with benches running the length of the car. No attempt was made to provide privacy for occupants of the cars and there were no curtains or partitions of any kind. The only comforts provided were a rug and a small pillow for each passenger. The traveller noted on entering a sleeping car that arms and legs were sticking up in much "admired disorder", which gave the impression that the occupants had been shovelled into the car.

Railway building continued at a rapid pace, particularly in Upper Canada. The completion of the Great Western from Windsor to Toronto and the Grand Trunk from Montreal to Toronto placed added importance on connecting and branch lines. In 1857 a line was completed from Lindsay to Port Hope, while another came into operation from Preston to Guelph.

In spite of the extensive programme of railway construction, few of the lines were enjoying prosperity. In 1854 passenger traffic fell drastically as a result of an epidemic of cholera. In the following year some 16,000 fewer immigrants arrived at Quebec than in the previous year. This had a profound effect upon passenger revenue since the transportation of immigrants and their effects accounted for a good deal of railway passenger traffic. The crop failure of 1857, quickly followed by a general depression, added to the plight of the railways, many of which were soon in financial difficulties.

In addition, the cost of railway construction was much higher than was expected. Wages in Upper Canada rose sharply with the increased building programme, while the Crimean War caused interest rates on loans to rise from two to seven per cent. At the same time inexperience on the part of contractors led to poor construction. Iron rails were found to be useless and they soon had to be replaced, while most of the ballasting was incorrectly done. As a result of these and other factors many of the railways were in great financial distress.

The Grand Trunk found that operating expenses were as high as 85 per cent of the gross earnings. The Great Western and the Northern, which had received assistance under the Guarantee Act, were also in difficulties. In 1856 the Northern defaulted payment of the government interest and by 1859 the track and rolling stock were in such a rundown condition that the government found it necessary to spend \$60,000 in order to put the line in shape.

To add to the troubles of the Great Western, a passenger train went through a bridge over DesJardins Canal near Hamilton in 1857 and sixty people were killed.

By the end of 1858, however, the Great Western had completed its line from London to Sarnia, while the Grand Trunk had kept pace by extending its road towards Sarnia as well.

In the same year the line from Halifax to Truro in Nova Scotia, that had been constructed under the leadership of Joseph Howe, was placed in operation.

At this time experiments were being made with coal-burning locomotives, although it was not until the 1870's that coal came into widespread use as engine fuel. Meanwhile the rural population living along the line found a ready source of income in supplying cordwood to the railway. Stacked along the line, it was picked up at intervals by a "wood train" and hauled to

the depots. At first the engines consumed a cord of wood every thirty-six miles, but according to one account, by 1859 the mileage per cord had risen to fifty.

The life of the fireman on a locomotive during this period was active in the extreme. The furnace consumed wood so rapidly that stoking by the fireman was almost constant. Between times, he was required to creep along the side of the engine while it was running to put tallow on the bearings. This could be a hazardous feat during bad weather. At stations, more cordwood had to be loaded, while water to feed the boilers was also replenished. The accumulation of cinders in the wire screening that covered the huge smoke stack required frequent removal as well. This was best accomplished by beating the mouth of the stack with a long pole. meanwhile the passengers assisted in loading wood or sat patiently waiting for the train to proceed on its way.

The year 1859 was an important one in the history of the Grand Trunk. The road was completed from Toronto to Sarnia, the Atlantic and St. Lawrence Railway from Portland, Maine, to the Canadian boundary was leased for 999 years, and finally the Victoria Bridge over the St. Lawrence river at Montreal was completed. The bridge was built by Robert Stephenson and was a wonderful example of engineering science. However, its total cost, of \$6,300,000 was out of all proportion to the prospective traffic over the bridge. The formal opening took place in 1860 with the Prince of Wales, later King Edward VII, as the central figure in the ceremony.

The visit of the Prince led to the construction of three special royal "parlour" cars by the Grand Trunk, Great Western, and Buffalo and Huron railways respectively in 1860. These parlour cars, the first in use on Canadian railways, were the last word in comfort and convenience. For example, the coach built at the Brantford shops of the Buffalo and Huron was forty feet long and was painted royal

blue outside. The interior was fitted up with lounges, chairs, marble slab tables, silk straw blinds furnished with spring rollers, carpets, and finally, brass hand-railings. It is worthy of note that the coach built by the Grand Trunk was equipped with a form of air-conditioning.

By 1860 the vigorous period of railway building that had featured the past ten years had come to an end. At this time the line from Rivière du Loup to Levis in Lower Canada was in operation, so that there was one continuous railway route from Rivière du Loup to Sarnia. In all there were ten lines of railway, some of them with numerous branches. Total mileage was 2,065, of which 1,383 miles were in Canada West, mainly in the Grand Trunk and Great Western lines. There were some three hundred locomotives "thundering and bellowing" over the province of Upper Canada.

A passenger on the Grand Trunk in 1861 wrote "... The conductors generally are civil fellows, but fearfully offhand . . . a manner engendered by the heterogeneous medley of mankind with whom they have to treat and converse. They have a curious word of command for summoning passengers in and out of the trains—ALL ABOARD and ALL ASHORE. This I discovered, after many enquiries, originated in the fact that before the grand Trunk Railway was invented all the traffic was by barges on the canals, and these were the captains' words of command . . .".

Meanwhile the provinces of New Brunswick and Nova Scotia were facing the same difficulties as were found in Lower and Upper Canada when it came to financing railway projects. New Brunswick had made a fruitless attempt to get aid from the British Government in the construction of the European and North American line. In addition plans for a railway from Saint John to Shediac and from Saint John to the state of Maine were delayed through lack of funds. The line from Saint John to Shediac was finally completed in 1860. In Nova Scotia, the Hon. Charles Tupper in 1859

declared that his government was opposed to government construction since money could not be obtained for such purposes.

As if financial problems were not enough, the people were constantly complaining to the authorities of the poor service on lines in Nova Scotia. In 1859 the train from Halifax to Truro ran hardly as fast as a stage-coach, while charges were so high that much of the freight was carried in winter by sleighs. A barrel of fish, for example, could be conveyed from Halifax to Truro by sleigh for 2s.6d. while to ship it by rail cost 3s.3d. At the same time, in winter, the service was cut from two trains to one a day.

Throughout this period an increasing amount of attention was being given to the question of uniting the various provinces by rail. The idea was put forward as early as 1836 but disagreement on the route to be followed and methods of financing the undertaking resulted in the proposal being shelved. Meanwhile, the various provinces had carried on railway construction at different points, all of which might fit into such a plan. As noted above, a line had been opened in Nova Scotia from Halifax to Truro in 1858, and from Saint John to Shediac in New Brunswick in 1860. By 1862 there were 780 miles of railway extending west from Rivière du Loup into Lower and Upper Canada. All that remained to be done was to connect the existing lines in order to provide rail transportation from Sarnia to Halifax. The American Civil War was used as a good excuse to appeal once more to the British government for financial aid, and a loan was at last guaranteed. Sandford (later Sir Sandford) Fleming, a Scottish-Canadian engineer was commissioned to survey the route of an intercolonial railway and his report was submitted in 1865.

In the meantime, negotiations for the political union of the provinces were progressing and Confederation was accomplished in 1867. One of the means of effecting a closer union of the provinces advanced during the negotiations was

the construction of a railway between the provinces. There was general agreement among the delegates, so that one of the first duties of the new federal government was to connect the railway lines already built and to construct a line between Truro and Rivière du Loup.

In 1867, when the union of the provinces took place, there were fifteen railways in Canada with some 2,495 miles of line. Locomotives in use totalled 485, while there were 310 first class cars, 374 second class cars, and 4,214 freight cars. A total of 9,391 persons were employed in keeping the lines running, while during the year 2,920,000 passengers were carried and 2,260,000 tons of freight.

While railway construction in the Maritime provinces was handicapped severely by lack of capital, some progress was made. The St. Andrews and Quebec Railway, under the name of the New Brunswick and Canada, was finally completed to Woodstock in 1868. In the same year the route of the proposed intercolonial railway through the province was finally settled, and commissioners were appointed to manage its construction.

A novel project was launched in Quebec in 1868 when the Legislature chartered six companies which proposed to construct colonization railways making use of wooden rails. Two of the lines, the Quebec and Gosford Wooden Railway and the Richelieu, Drummond and Arthabasca, were actually built. The rails were made entirely of wood, usually maple, and were fitted into notches that were cut in the ties. Wooden wedges were then used to hold the rail firmly in place. No nails were used at all in laying the tracks. A major problem, however, was created when the rails began to warp and after two years of operation the Gosford line was abandoned.

Weather was a major factor in the operation of the railways, with the snow creating great difficulties as it does even today. A traveller who was marooned on a snowbound Grand Trunk train between Brockville and Kingston in 1869 left a rather eloquent paragraph on the "dead" locomotive, when he noted. "Distant 20 yards is the dark figure of the

dead locomotive; the snow has held high revel under it, on it, and around it, adding many a piece of ornamental frostwork to its iron sides. It makes one melancholy to look at it—a mechanical Samson shorn of its might—a genius of steam prostrated—its breathing gone—its power annihilated—unwieldy as a ship on shore—there it stands looking like some monument of past greatness.” There were no snowploughs in use and when a train became stalled in the drifts, there was no alternative but to shovel the snow away by hand. It was not unusual for passengers to be stranded on a snow-bound train for days, when food became a real problem for dining cars had not been introduced as yet. In fact, it was not until 1876 that dining, or “hotel” cars, as they were called, first appeared in regular service on the Great Western Railway.

In 1870 the Grand Trunk introduced the Pullman sleeping car to Canadian railways. A contemporary writer described the sleepers on the Grand Trunk as “the most comfortable of any we have seen; almost in every respect like the berths of a first class cabin in a steamer, all enclosed with the convenience and comforts of a good bed, wash stand, etc. The luxury can be enjoyed by paying \$1 extra.”

Meanwhile it was becoming more apparent that use of the broad gauge on the Grand Trunk was a mistake. American railways were all using the standard gauge of 4 feet, 8½ inches, and other Canadian railways had also adopted it. It was decided in 1871 to convert Grand Trunk lines to the narrower gauge and work began immediately on this major undertaking. By September 1874 the task was completed, and the Grand Trunk now had uninterrupted connections with American railway lines at both ends of the system.

In 1871 the province of British Columbia was admitted to Confederation, one of the conditions being that “The Government of the Dominion undertake to secure the commencement simultaneously, within two years from the date of the Union, of the construction of a railway from the Pacific towards the Rocky Mountains, and from such point as may be selected, east of the Rocky Mountains, towards the

Pacific, to connect the seaboard of British Columbia with the railway system of Canada; and further, to secure the completion of such railway within ten years from the date of the Union." Thus was set forth one of the most ambitious railway buildings projects ever undertaken—the construction of the Canadian Pacific Railway.

At the same time the work of building an intercolonial railway from Truro to Rivière du Loup was progressing. In 1872 the railways in Nova Scotia and New Brunswick were re-constructed and named the Intercolonial Railway by Order-in-Council. Work on new sections of the line was slow, however, although the section from Moncton to Truro was opened in 1872. Tenders were submitted for the construction of the whole road but the government decided to award contracts for small sections to numerous contractors. Difficulties beset the builders almost from the outset. Heavy rock cuttings were needed in some regions while extensive swamps had to be filled up in others. Many of the contractors went bankrupt or threw up their contracts.

Undaunted by such adversity, the Commissioners who were charged with building the road went ahead with their plans to get the Intercolonial Railway in operation. The Year Book of 1872 reported that "the Commissioners have contracted for 40 engines, 250 box freight cars and 150 platform cars. 15 of the engines are from Glasgow, at \$11,000 each in bond; 15 from Kingston at \$12,500 each; and 10 from Halifax, at \$12,500 each. The freight cars are contracted for—150 from Toronto, at \$719 each; 50 from St. John, at \$735; and 50 from Dorchester at \$765. 90 platform cars are to be from Montreal, at \$570 each; and 60 from Londonderry, at \$580 each . . .".

While the growth of Canadian railways at this time was not as widespread as it had been in the 1850's, it was nevertheless steady. Existing lines were improved and extended into new areas, while new roads were constructed to serve the growing need for transportation facilities. The Grand Trunk extended its lines from Toronto to Owen Sound and

Southampton in 1873, while the Canada Southern railway was completed from Fort Erie to Amherstburg in the same year. A highlight of 1873 was the opening of the Union Station in Toronto. This elaborate station, now replaced, was regarded as the last word in architecture and was described as "capacious and elegant". Kincardine was reached by the Grand Trunk in 1874, Midland in 1876, Barrie in 1878 and Collingwood in 1879.

Meanwhile plans for the construction of a railway across the island of Newfoundland were under consideration. A survey was made in 1868 under the direction of Sandford Fleming, the survey line being from St. John's on the east to St. George's Harbour on the west coast. Report of the survey was made in 1873 but it was some years before construction of the railway was commenced by a private company.

In 1874 the work of building the Intercolonial Railway was transferred to the Department of Public Works by an act of the Federal Parliament. The Commissioners charged with the construction of the road had made considerable progress with the work. The difficulties to be overcome, however, were such that the government recognized the need for more direct control. The Act of 1874 made the railway a public work and placed the responsibility for its rapid completion upon a department of the government itself.

The work of changing the gauge to 4 feet, 8½ inches, on the section between Halifax and Saint John, N.B. was completed in 1875, while steady progress was made on the construction of new sections of the line in the same year. As a result the Intercolonial Railway completed its connection from Halifax to Rivière du Loup on July 1, 1876, and the whole line was opened for traffic. The Intercolonial now extended for a distance of over 700 miles and touched six Atlantic seaports.

In the meantime, action had been taken by the government to get work started on the transcontinental railway leading to British Columbia and in 1874 construction actually began.

In 1873 the province of Prince Edward Island had entered Confederation. At that time the Government of the Island had a railway under construction to connect the principal centres of the Island. The line, which was 210 miles long, was taken over by the Federal Government and was opened for traffic in April 1875.

The use of iron rails had been found to be unsatisfactory as the wear was excessive and the upkeep extremely heavy. As a result, most of the railways turned to the use of steel rails. The railway report for 1876 indicated that there were $2,273\frac{3}{4}$ miles of steel rails, representing about 45 per cent of the main tracks in Canada.

While iron could not be used for rails, it came into its own in the matter of bridges. When the Intercolonial was under construction a controversy raged between engineers and other interested parties over the use of wooden bridges on the line. It was finally decided that iron should be used even though the various parts of the bridges had to be made in England. In 1877 the wooden bridge on the Intercolonial at Elmsdale, Nova Scotia, was replaced by the first iron railway bridge in the province. In the following year an iron bridge was also installed at Enfield on the same line.

Meanwhile, progress was slow on the transcontinental railway. Economic depression followed by political upheavels and changes of government, lengthy disputes over routes and terminuses had all delayed construction. In 1878, however, the government completed a line from Emerson on the American border to Winnipeg. This railway gave Manitoba access to the east, although the connection was through St. Paul, Minnesota and thence eastward through the United States. At the same time construction was advancing slowly on a stretch of railway from Fort William at the head of Lake Superior to Winnipeg. Aside from these developments, little had been achieved in fulfilling the dream of a transcontinental railway.

In May 1879 the Department of Railways and Canals was established by the Federal Government with its own Minister.

From this time there was increased activity by the government in the field of railway development. One of the first major transactions of the new Department was the purchase of the Rivière du Loup line from the Grand Trunk for \$1,500,000. The line, which ran from Quebec to Rivière du Loup, added 126 miles to the government-owned Intercolonial Railway.

For many years there had been talk of a railway running north of the St. Lawrence river from Quebec to Montreal, and thence to Ottawa. The importance of such a line was impressed upon the government even before Confederation, so that in 1859 a grant of 1,500,000 acres of land was offered to any company willing to undertake the work. No further action was taken at that time and it was not until 1868 that efforts were made to revive the project. Eventually two companies were formed, the North Shore, which was to build the Quebec and Montreal line, and the Montreal Northern Colonization Railway, which would construct the Montreal-Ottawa section with a branch line to St. Jerome. Both of the companies began work, but lack of funds made it impossible for them to complete the project.

In 1874 the government of Quebec undertook to finish the North Shore line and floated a loan for \$3,000,000 on the English market with which to finance the undertaking. Progress was slow, however, and it was 1879 before the line was in operation. By this time the cost of the railway was \$13,985,740. It was obvious from the outset that it could not be operated at a profit by the province, and in 1884 both sections of the line were sold to the Canadian Pacific Railway.

Meanwhile construction on the trans-continental railway was continuing, although progress was so slow that British Columbia had threatened to break from Confederation. By 1880 about 700 miles of line had been built. In that year the government announced that arrangements had been made for the railway to be built by private enterprise, and on October 21, 1880, the contract was signed with the Canadian Pacific Railway Company. The terms called for completion of the road within ten years. In return, the Company was to receive

free those sections that had been already built, the sum of \$25,000,000 in cash, 25,000,000 acres of land in the "fertile" belt, among other concessions.

In the same year the Grand Trunk obtained direct connections with Chicago, through Detroit, operating under the name of the Grand Trunk Western Railway. Prior to this time the Michigan Central Railway had charge of Grand Trunk traffic in the region.

No time was lost by the Canadian Pacific Railway in commencing construction of the transcontinental line. Work on the western plains began in May 1881, and by the end of the year a total of 161 miles had been built. This pace was regarded as too slow and every effort was made to increase it. In 1882 three hundred subcontractors were employed on the line, while bridging crews and track-layers followed closely after the graders who were preparing the roadbed. Throughout the year over two and one half miles of track a day were laid. This was a remarkable feat when it is remembered that every rail, spike and timber had to be transported hundreds of miles before being put to use.

At the same time the Grand Trunk was expanding its operations in Eastern Canada. In 1882 the Great Western with 904 miles of tracks, was amalgamated with the Grand Trunk while an additional 473 miles of railway in Western Ontario were also taken into the system. Further consolidation took place in that region when the Michigan Central Railway agreed to operate the Canada Southern Railway and its controlled lines for a period of twenty-one years commencing January 1, 1883.

Rapid progress continued to be made on the construction of the Canadian Pacific. In 1883 the thriving city of Winnipeg was linked by rail and water with Eastern Canada, when one train a day began to operate on the line from Port Arthur to Winnipeg. Describing a journey on one of the first trains over this line, Sandford Fleming wrote, "It was dark when the train left (Port Arthur), so that all that could be done was to turn to the comfortable Pullman, and in due time retire for

the night. The railway to Winnipeg is far from being completed; indeed, it has but lately been put in operation. Many of the station buildings have yet to be erected. As a consequence, the following morning the breakfast was served under a large canvas awning."

The completion of the Port Arthur and Winnipeg section of the line was a considerable achievement for the country was rugged and construction difficult. In describing the work Fleming observed, "The surface is a succession of rocky ridges, with tortuous lakes and deep muskegs intervening. The line has been carried across these depressions on temporary staging, and steam shovels and construction trains are busy converting the miles of frail-looking trestlework into solid embankment. Our train moves slowly over this portion of the line; indeed, until this work is further advanced it would be hazardous to adopt a high rate of speed."

While success crowned the efforts of the builders, Fleming noted that it was not without sacrifice and tragedy that the line was finally completed to Winnipeg. "A few rude graves on the hillside mark the violent death of the poor workmen who suffered from the careless handling of that dangerous explosive, nitro-glycerine. Although the most effective of instruments in the removal of rock, the least want of caution and care often exacts the most terrible penalty. In the fifty miles we have passed over, upwards of thirty poor fellows have lost their lives by its use."

On arrival in Winnipeg, the writer observed that "we reach the station . . . having been twenty-four hours on our journey. A few years ago the distance from Lake Superior to this point, by the old canoe route exacted 12 or 14 days."

The influx of settlers to Manitoba following the completion of the railway to Winnipeg and the rapid growth of towns and villages made railways increasingly important. In 1883 the Manitoba and North Western Railway was opened from Portage la Prairie to Minnedosa, while two years later an official expedition was sent out to explore the possibilities of a railway from the prairies to Hudson Bay.

While the Canadian Pacific line from Port Arthur to Winnipeg was in operation in 1883, it was not until the following year that attempts were made to build the line through the wilderness north of Lake Superior. Over nine thousand men were employed on this stretch alone while the vast areas of rock and muskeg made construction extremely difficult. In fact, it is claimed that in one stretch of muskeg there are seven layers of Canadian Pacific rails buried, one below the other. So great were the difficulties created by rock that a dynamite factory was built on the spot to supply the need for blasting powder. One particularly difficult mile cost \$700,000 to build, while several others cost over half a million each.

Meanwhile, strenuous efforts were being made to push the line through the mountains of British Columbia. Thousands of Chinese labourers were employed on the difficult Kamloops-Port Moody section, and the final gap was filled in on the main line when the last spike was driven at Craigellachie in the Eagle Pass, November 7, 1885. The longest railway in the world was now open from coast to coast—east and west were linked by steel.

In December, 1885, the first train of wheat from Canadian prairie farms, consisting of sixteen cars, left Portage la Prairie for Fort William where the wheat was sent by ship to Montreal. In May, of the following year the first passenger train reached Vancouver from Eastern Canada.

Throughout this period, the government had been expanding the lines of the Intercolonial Railway in the Maritime provinces, through the completion of numerous small branches. In 1885 the Cape Traverse branch, 13 miles in length, was completed along with the St. Charles Loop line of 14 miles and the Dalhousie branch of 7 miles. During the next two years the Rivière du Loup, Dartmouth and Pictou branch lines were put into operation. All of these branches were built to provide rail facilities for the towns mentioned and none was longer than fourteen miles.

In 1887, twenty years after Confederation, there were 11,691 miles of railway in operation throughout the country.

Over half of this amount was to be found in the Canadian Pacific system with 4,274 miles and the Grand Trunk system with 2,598 miles. Nearly eleven million passengers were carried in that year, while the freight handled was over sixteen million tons. It is interesting to note that the major freight items were flour, grain, livestock, lumber, firewood, and manufactured goods. The Grand Trunk carried 39.4 per cent of all the freight while the Canada Southern was next with 15.7 per cent. Rolling stock on all lines totalled 1,633 locomotives, 74 sleeping and parlour cars, 762 first class cars, 514 second class and emigrant cars, 62 baggage, mail and express cars, 24,399 cattle and box cars, 13,136 platform cars, and 3,057 coal and dump cars.

Improvements were constantly being made in equipment and by 1888 some of the passenger cars on the main lines were lighted by electricity and heated by steam.

Construction of the Canadian Pacific through Northern Ontario continued to progress rapidly. In 1888 the line was open from Sault Ste. Marie to Sudbury, while the first freight train of 19 cars of flour entered Canada over the Sault Ste. Marie bridge on January 9th of that year. At the same time the Grand Trunk was expanding its facilities in Southern Ontario through union with the Northern Railway and its leased line, the Hamilton and North Western.

The great rush of settlers to the northwest following the completion of the Canadian Pacific, and the rapid growth of towns and villages on the broad prairies soon brought about further railway construction. In 1889 the government granted a money subsidy to the Qu'Appelle-Long Lake and Saskatchewan Railway and Steamboat Company for the construction of a railway through the central prairie region. In the following year the Canadian Pacific opened a line from Regina to Prince Albert, while by 1891 the Calgary-Edmonton line had reached Strathcona (South Edmonton).

The St. Lawrence river and Great Lakes were a formidable obstacle to the development of railways between Eastern Canada and the United States. As indicated above, the

opening of the Suspension bridge over the Niagara river in 1855 marked the first successful attempt to overcome the water barrier, while the opening of the Victoria bridge at Montreal in 1860 provided the first means for crossing the St. Lawrence river by train. Further progress was made in the development of international railway traffic when the Sault Ste. Marie bridge was completed in 1887. In the same year a railway bridge was built over the St. Lawrence at Lachine while the Canada Atlantic Railway opened its bridge over the same river at Coteau in 1890.

A most noteworthy achievement in the development of rail traffic between Canada and the United States was the completion of the St. Clair tunnel between Windsor and Detroit in 1891. The tunnel, which required over two years to build, was 6,026 feet in length and cost about \$2,700,000. It was opened for freight traffic on October 27th, 1891, while the first passenger train went through the tunnel on December 7th of that year.

Meanwhile in the Maritime provinces, the government took over the Cape Breton railway which was completed on January 1, 1891, and which extended for 96 miles from Point Tupper to Sydney. The line was combined with the Intercolonial system under an Act of the federal parliament. In the following year, the Carleton branch of the Intercolonial in New Brunswick was transferred to the city of Saint John for \$40,000 and was promptly leased to the Canadian Pacific for 999 years.

The rapid expansion of the railways led inevitably to a great increase in the number of persons killed or injured as a result of accidents. In 1875 there were 92 people killed and 289 injured. By 1892 these figures had risen to 233 killed and 879 injured. A breakdown, however, shows that a majority of the accidents occurred to employees of the various lines, with trespassers coming second:

	1892	<i>Killed</i>	<i>Injured</i>
Passengers.....		14	40
Employees.....		110	700
Others.....		109	139

Eight of the passengers were killed while getting on or off trains in motion, so that only six passengers were actually killed while travelling on the trains. The efficiency of the railways at this time is indicated in an item that appeared in the Montreal Star of January 18, 1893, "Mr. H. Montagu Allen arrived in town this morning from Winnipeg, having come on by C.P.R. special. His train made remarkably good time for this season of the year, having covered the distance from Winnipeg to Montreal, 1,425 miles, in $45\frac{1}{2}$ hours, an average of $31\frac{1}{3}$ miles an hour. Between Winnipeg and Fort William the average time made was 35 miles an hour."

It was not only in passenger service, however, that progress was made. The development of the dairy industry in eastern Canada and the rapid expansion of the export trade in butter brought about the need for some means of refrigeration on the railways. In 1895 the first refrigerator cars were placed in service, and by 1901 ice-cooled refrigerator cars were in operation from eight different points to the cold-storage warehouses in Montreal.

The great spread of population throughout the west following the completion of the Canadian Pacific soon turned the thoughts of railway builders to the possibilities of another transcontinental line. The first action was taken in 1896 when the Lake Manitoba Railway and Canal Company began construction on the line from Gladstone to Dauphin in Manitoba. Expansion was rapid after that date. The name was changed to the Canadian Northern Railway and in 1901 the Manitoba lines of the Northern Pacific were absorbed into the system. Aided by generous subsidies from the provinces, a line was built the following year connecting Manitoba with the head of the Great Lakes at Port Arthur. In 1903 the Canadian Northern received a guarantee of bonds from the federal government and construction began on through lines of railway to Edmonton and Prince Albert.

Meanwhile, control of the Grand Trunk Railway virtually passed from England to Canada in 1896 when Charles M. Hays became General Manager and later President of the company.

Mr. Hays, who had been General Manager of the Wabash Railway in the United States, soon made his presence felt. Equipment was improved, larger freight cars were purchased and new terminals were acquired by the company. Between 1896 and 1901 three of the main bridges on the Grand Trunk system, the Suspension bridge at Niagara, the International bridge at Fort Erie, and the Victoria bridge at Montreal, were all rebuilt. Work was speeded up on double-tracking the main line between Montreal and Toronto, while many of the curves and steep grades were eliminated. To assist in the rapid handling of grain, elevators were purchased or built at Portland, Montreal, Midland, Tiffin, Goderich, Point Edward and Fort William. Trains now came in on time and the service over the entire system was vastly improved.

During these years construction was proceeding on a railway from St. John's to Hall's Bay in Newfoundland. Work on the line was commenced on August 9, 1881 and for a short time progress was steady. The inhabitants on the south shore of Conception Bay, however, took exception to the tracks crossing their land. They stoned the engineers, took away their instruments and finally drove them off. Any attempt to continue the work was met by a formidable array of citizens armed with a variety of weapons including guns. This disturbance, which came to be known as the "Battle of Fox Trap", was brought about by a St. John's merchant who informed the south shore inhabitants that building of the railway would lead to the seizure of their farms. The arrest of the ringleader soon restored order, however, and work continued, although it was not until 1896 that the railway was finally completed. It was built on a narrow gauge of 3 feet, 6 inches, and extended for a total distance of 547 miles from St. John's to Port aux Basques.

In 1897 the first sod was turned on the Ottawa and New York Railway which was to operate between Ottawa and Cornwall, Ontario. In the same year the Cornwall bridge

was completed over the St. Lawrence river so that the railway would have connections with American lines to the south. Later the Ottawa and New York was taken over by the New York Central.

The discovery of gold in the Yukon led to a great "rush" of miners and prospectors in 1897. The goldfields were reached only with the greatest difficulty over rugged trails, mountain passes, and turbulent streams. In 1898 construction began on the White Pass and Yukon Railway, the project being financed by an English company. The line ran from Skagway, Alaska to Lake Bennet in the Yukon and was opened to traffic in July 1899. By 1900 the railway was extended to Whitehorse, covering a total distance of 115 miles.

By the end of the nineteenth century there were 17,481 miles of railway in Canada. Of this total, the Canadian Pacific had 6,873 miles, the Grand Trunk 3,138 miles, and the Intercolonial 1,511. The total amount of capital invested in Canadian railways had reached the impressive total of one billion dollars by 1901, while over 18 million passengers and 37 million tons of freight were carried in the same year.

In 1902 the Ontario government began the construction of the Temiskaming and Northern Ontario railway, with the object of opening up the northern regions of the province to settlement and particularly the "clay belt" which lay south of Hudson Bay. The line extended from North Bay to Cochrane where it connected at a later date with the Grand Trunk Pacific. In 1903 the discovery of silver at Cobalt did much to stimulate settlement and business for the railway, although it was not until 1931 that the Temiskaming and Northern finally reached Moosonee on an estuary of James Bay.

Meanwhile, in 1902, the Grand Trunk laid a proposal before the Government whereby it might have a share in the settlement and development of the west. The Grand Trunk, which already had a line to Chicago, was to lease additional lines to Winnipeg through Minneapolis. A new line would be constructed from Winnipeg to the Pacific coast with the

aid of a government grant. The government rejected the proposal, since so much of the line would be in the United States, and offered to construct a line from Moncton, New Brunswick, to Winnipeg which it would lease to the Grand Trunk for fifty years. It was further suggested that the western half of the proposed railway should be built by the Grand Trunk with the government guaranteeing interest on the bonds. The Grand Trunk reluctantly accepted this proposal and in 1903 construction of the third transcontinental line was begun. The eastern section was to be known as the National Transcontinental, and the western section as the Grand Trunk Pacific.

With the rapid expansion of railways and the need for control over transportation, the government appointed the Board of Railway Commissioners in 1904. This Board took over the functions of the Railway Committee of the Privy Council as a rate-controlling body, and assumed jurisdiction over all matters relating to the location, construction and general operation of railways.

The work of building the Canadian Northern across the prairies was progressing rapidly. As stated above, the link from Port Arthur to Winnipeg had been completed in 1902. After that date every effort was directed towards the completion of the line to the west coast. On November 27, 1905, the first Canadian Northern train direct from Winnipeg arrived at the station in Edmonton. It was some years before the line was to reach Vancouver.

Continued interest in the gold-mining areas of the Yukon led to the completion of the Klondike Mines Railway in 1906. This railway, which was wholly within the Yukon territory ran from Dawson to Sulphur Springs, a distance of thirty miles. Dwindling traffic soon presented difficulties, however, and in 1915 the line was forced to close down.

Construction began on the Grand Trunk Pacific and the National Transcontinental in 1905 when the first contracts were let. The route of the eastern section ran far to the north of the St. Lawrence river system with a view to opening up

vast new areas of Northern Ontario and Quebec. It was intended to run branch lines to Fort William, North Bay and Montreal, but only the first of these was actually constructed.

Political difficulties delayed construction in New Brunswick, for a strong group in the province favoured Saint John as the terminus rather than Moncton, while engineering problems slowed down the work in northern regions. The collapse of the bridge being constructed over the St. Lawrence at Quebec in 1907, with great loss of life, made it necessary to use car-ferries on the line for some time. In spite of these difficulties, however, progress was steady.

A good route through the prairies led to the rapid construction of the Grand Trunk Pacific, although there were strong protests from the Canadian Pacific that the route chosen was parallel to its line. Yellowstone Pass was finally selected as the route through the mountains while Kaien Island, 550 miles north of Vancouver, and soon to become the new city of Prince Rupert, was chosen as the western terminus.

Steady progress was made on building the line across the prairies and in September 1909 the first Grand Trunk Pacific train reached Edmonton from Winnipeg.

A revolutionary development took place about 1910 when the Canadian Pacific introduced the first oil-burning locomotive in Canada. This locomotive was converted from a coal-burner and was designed for use in the Rocky Mountains. It was not until 1917-19, however, that a complete class of oil-burners was built by the C.P.R.

For twenty-five years there had been talk of a railway from the prairies to Hudson Bay. The expansion of settlement and the subsequent development of agriculture turned the thoughts of western farmers to European markets. It was felt that a railway to Hudson Bay would enable prairie farmers to reach the markets of Europe with greater speed and at less cost than by using the long route to east coast ports. An official survey was made in 1885 but no action was taken until 1910 when the federal government authorized the

building of the railway. It was to run from The Pas in Manitoba to Port Nelson. Work was begun on September 6, 1910, when the first sod was turned by the Hon. George Graham, Minister of Railways and Canals. By 1913 a total of 56 miles, from The Pas to Scott, had been completed. The outbreak of war in 1914 delayed further construction and by 1924 only 300 miles of the line had been built. It was finally completed in 1931 after the terminus was changed from Port Nelson to Churchill.

By 1913, the prairie provinces had become a veritable network of railways as the Canadian Pacific, the Canadian Northern, and the Grand Trunk Pacific all extended their lines to new points. In that year, the Canadian Pacific had 6,236 miles of tracks in the prairie provinces, the Canadian Northern had 4,111 miles, while the Grand Trunk Pacific totalled 2,039 miles.

The year 1915 was an outstanding one in the history of Canadian railway building for both the Canadian Northern and the Grand Trunk Pacific were completed. This gave Canada three transcontinental railway lines. The Canadian Northern extended from Quebec to Vancouver, while the Grand Trunk Pacific, including the National Transcontinental, reached from Saint John, New Brunswick to Prince Rupert, British Columbia. In that year there were 35,582 miles of railway in operation throughout the country, while both the Canadian Pacific and the Grand Trunk owned extensive mileages in the United States.

A signal achievement in the year 1917 was the completion of the famous Quebec bridge across the St. Lawrence, a few miles above Quebec city. The bridge was the longest single cantilever span in the world, extending for 1,800 feet centre to centre of piers, or over 90 feet longer than each of the main spans of the Firth of Forth bridge in Scotland. It carried a double track railway and was designed so that each member of the structure would bear a total stress of nearly 30,000,000 pounds. The total weight of steel in the bridge was 66,480 tons, while the cost reached \$22,500,000.

From the outset, the Canadian Northern and the Grand Trunk Pacific were in financial difficulties. In the first year of operation the company had to ask the government for money to pay bond interest, while in 1916 they got a further loan of \$15,000,000. The Grand Trunk Pacific found itself in a similar position with respect to finances and in 1916 the government appointed a commission to investigate the railway problem in Canada and advise the government on what action was necessary to meet the situation.

After lengthy investigation, the Railway Inquiry Commission recommended that the Canadian Northern, the Grand Trunk and the Grand Trunk Pacific be surrendered to the people of Canada, since all three lines had operated largely with the assistance of government funds. A further recommendation was made that the government create by Act of Parliament a board of trustees, "a permanent, self-perpetuating body," in which ownership of these railways would be vested and which would operate them.

In 1917 legislation was passed for the acquisition of the Canadian Northern, while in 1919 the Grand Trunk Pacific was allowed to go bankrupt. The Minister of Railways, as receiver, then took over the operation of the line and began negotiations to purchase the Grand Trunk. At the same time the government passed the Canadian National Railways Act which made provision for the operation and management of government railways by the Canadian National Railways Board.

In 1921 the Grand Trunk Railway was purchased by the government and in 1923, under an order-in-council, the management and operation of all government railways including the Grand Trunk and the Intercolonial was passed to the Canadian National Railways under the direction and control of a president and a board of directors appointed by the government.

The establishment of the Canadian National Railways meant that this new system and the Canadian Pacific now owned or controlled some 95 per cent of all the railway

mileage in Canada. In 1923 the Canadian National had 20,573 miles of track, while the Canadian Pacific had 13,563 miles. With such extensive lines both the Canadian National and the Canadian Pacific ranked among the largest railway systems in the world.

In a constant effort to improve service for the travelling public, Canadian railways kept in the forefront in the introduction and use of modern equipment. In 1928 the Canadian National introduced the first road diesel electric locomotive in North America. In 1935 the Canadian Pacific brought air-conditioning into use when the sleeping car "Sturgeon Falls" was so equipped. Bigger and more powerful types of locomotive were brought into service as an expanding economy placed increasing strain on transportation facilities.

By the Transport Act of 1938 the Board of Railway Commissioners, originally established in 1904, was renamed the Board of Transport Commissioners for Canada and its powers, previously confined to railways, were extended to cover transport by water and by air as well as by rail.

With respect to rail transport, the Board had control over matters relating to the location, construction, and operation of railways. The most important power of the Board was control over passenger and freight rates.

The outbreak of war in 1939 placed a heavy strain on Canadian railways. As one of the chief suppliers of food-stuffs, war materials, and equipment, Canada was faced with a transportation problem of great magnitude. Such supplies had to be moved in a continuous stream from the factories and farms to the ports, while the mobilization of the armed services and industry meant a heavy movement of manpower as well. The railways of Canada met this challenge with marked success.

From the outset, the railways of Canada were faced with shortages of rolling stock and other equipment necessary to transport the "sinews of war". Government assistance was given in the acquisition of rolling stock and equipment, while

the railways themselves began a programme of rebuilding equipment to meet the pressing need. Old switching engines for example, that had been considered obsolete were overhauled and brought back into operation. Passenger cars and sleeping cars were converted to meet the need for transporting large numbers of troops. New-type restaurant cars were pressed into service to accommodate maximum numbers of patrons with a minimum of staff. All repairs, conversion and new construction had to be undertaken in the workshops of the railways themselves since outside industries were fully engaged in producing war materials.

Numerous intricate problems had to be solved in the successful movement of much bulky and very heavy war equipment. In order to move such machines as landing barges, it was necessary in some places to lower the railway tracks so that the loads might pass under bridges. Some pieces of machinery were so large that two and sometimes three railway cars were required to accommodate them. This, in turn, necessitated careful re-scheduling of trains on the lines over which such loads were to be moved.

In spite of these tremendous difficulties and despite the loss of over 40,000 trained railway employees to the armed services, the volume of both passenger and freight traffic carried over Canadian railway lines was more than double that of the immediate pre-war years, while the freight carried was three times that of 1933. Over 60 million passengers were carried in 1944 while volume of freight reached 155 million tons.

It is interesting to note that the vastly increased volume of traffic was handled by fewer but more powerful engines and larger freight cars. The Canadian Pacific operated 26·8 per cent fewer locomotives and 16·6 per cent fewer freight cars to carry the greatly increased war traffic in 1944 than they had in operation in 1917. The Canadian National had 16·6 per cent fewer engines and 15·4 per cent fewer freight cars in use than in 1917. This was due to the fact that the tractive power of modern Canadian locomotives was 32 per

cent higher than in 1920 while the capacity of freight cars had risen from 35 to 43 tons per car. In addition, the speed of freight trains was increased by 60 per cent over 1917, which resulted in quicker turn-around for cars.

In addition to maintaining the equipment necessary for handling the largest volume of traffic in their history, the railways were actively engaged in the manufacture of war materials themselves in their various car shops, locomotive works, and other plants.

The Canadian National Shops at Point St. Charles, Montreal, made naval guns and field artillery gun carriages, while munitions were made at three other plants. Shipyards of the Company at Prince Rupert, B.C. constructed cargo vessels and mine sweepers.

The Canadian Pacific Angus Shops at Montreal employed 11,000 people in the manufacture of tanks, marine engines and condensers. The Ogden Shops at Calgary produced naval guns, anti-aircraft gun mounts, gun barrels, sights, and other equipment.

The return of the railways to a peacetime basis following the close of hostilities was accomplished with efficiency and dispatch. Much of the older equipment was retired while all railways directed their efforts towards improving the services that were offered to the travelling public. A major step towards increased operating efficiency was the vast programme of dieselization undertaken by both of the major railways. Newer and more powerful types of diesel engine were placed in service throughout the country, until in January 1951 there were 572 diesel-electric locomotives in use or on order.

The entry of Newfoundland into Confederation in 1949 added further mileage and equipment to Canadian railways. Absorbed by the Canadian National system, the Newfoundland Railway had 705 miles of track, of which 547 miles were on the main "Overland Route" from St. John's to Port aux Basques. The importance of the line is indicated by the fact that in 1948 274,497 passengers were carried, and 856,560 tons of freight.

As the development of the vast resources of Canada continues there is a further need for the construction of new railway lines. Typical of such construction is the Quebec, North Shore and Labrador Railway. This line, which is being built by the Iron Ore Company of Canada to provide access to the huge deposits in northern Quebec and Labrador, will extend from Sept Isles on the Gulf of St. Lawrence to Burnt Creek on Knob Lake, a distance of 360 miles.

The route was surveyed in 1949 and construction of the railway was begun in the following year. The use of modern machinery has speeded up the work, but progress has been difficult owing to the rugged terrain through which the railway passes. It is expected to operate the first train over the line early in 1954 when the initial shipment of iron ore is made. Some idea of the size of the undertaking is found in the fact that the cost of constructing the railway is expected to exceed two hundred million dollars.

In 1950 there were 57,997 miles of railway in Canada. This total was surpassed only by the railway mileage of the United States and the Union of Soviet Socialist Republics, both of which have populations far greater than that of Canada.

This vast network of railways, based on the two trans-continental systems, continues to play a vital role in the life of the country. As industry, commerce and trade increase; as our natural resources are explored and developed, so the railways must expand into new regions and in new directions. Such growth and expansion provide the ready means whereby much of the business of Canada is kept in motion; many of the products of farms and factories are carried speedily and efficiently to markets and ports. How well the railways of Canada were providing such means is seen in the fact that in 1950 over 55,500,000 ton-miles of freight were carried; 31,139,000 passengers were transported; while over 190,000 employees were engaged in keeping the railways operating at peak efficiency throughout the land.

CHAPTER IV

TRANSPORTATION BY AIR

Canadian scientists and engineers played a leading part in the development of the aeroplane as early as 1902. In that year, W. R. Turnbull, who has been called the "father of aeronautical research in Canada", set up a small wind tunnel at Rothesay, New Brunswick, and began a series of experiments which led to the discovery of laws explaining the longitudinal stability of aeroplanes. In addition, he developed the static laws of air propellers, and in later years, evolved and developed the controllable-pitch propeller. These discoveries had an important effect on the development of aircraft and contributed much to the advancement of flying.

While Mr. Turnbull was commencing his work at Rothesay, Dr. Alexander Graham Bell was engaged in experiments with kites at his summer home at Baddeck, Cape Breton Island. In 1907 the "Aerial Experiment Association" was formed for the purpose of carrying on experiments in the flight of heavier-than-air machines. The Association comprised five members: Dr. Bell; J. A. D. McCurdy and F. W. Baldwin, two Canadian engineers; Glen Curtiss, a builder of motorcycle engines from New York; and Lieutenant Selfridge, on leave from the United States army. Experiments conducted by this group led to the first flight in Canada on December 7, 1907, when the "Cygnet", a type of kite, carried a passenger aloft while being towed by a steam tug.

On February 23, 1909, an aeroplane, the "Silver Dart", which had been designed and built by McCurdy, was taken out on the ice at Baddeck for a test flight. With McCurdy as the pilot, and under its own power, the aeroplane flew for half a mile at a height of thirty feet and a speed of 40 miles an hour. This was the first successful aeroplane flight in the British Empire, and McCurdy became the twenty-first person in the world to fly an aeroplane. The "Silver Dart",

itself, was an advance on any type of aircraft previously flown for it had a three-wheel undercarriage, tapered wings, and made use of aileron controls.

During the Great War 1914-18, Canadian pilots became famous for their daring achievements. Flyers like Bishop, Barker, Collishaw, MacLaren, and McLeod, among others, became known throughout the world for their skill and courage. It became evident that, in the field of aviation, Canada was to be one of the leading nations.

As the war progressed, training units were established in Canada, while Canadian Aeroplanes Limited was organized by the Imperial Munitions Board to build training aircraft. The success of the plan is indicated by the fact that, at the end of the war, 2,900 aircraft had been built in Canada by the company.

The increase in submarine activity along the Atlantic coast in the latter part of the war led to the establishment of the Royal Canadian Naval Air Service to patrol the coasts of the Maritime provinces and along the Gulf of St. Lawrence. Halifax and Sydney were chosen as bases and the patrols began on August 25, 1918.

The war established the position of aircraft in the field of rapid transportation, and with the coming of peace, it was soon apparent that civilian use of aeroplanes would be widespread. In June, 1919, provision was made for the appointment of an Air Board to control aerodromes, aircraft, and aerial navigation in Canada. The Board was to have jurisdiction over civil aviation, flying operations for other government departments, and the direction of the Canadian Air Force.

The first aircraft to be used in Canada for commercial purposes were flying boats. These were employed by forestry officials in the province of Quebec during the summer of 1919. The aircraft proved to be so successful for "timber cruising" and sketching of timbered areas that a rapid expansion in the use of flying boats for forest patrolling and other services took place during the next three years.

At the same time Canadian pilots who had gained experience with the Royal Flying Corps during the war introduced commercial flying to the western provinces. In 1919 Captain Wilfred "Wop" May, who had won the D.F.C. with the Royal Air Force, together with his brother Court, and Vic Horner, made use of a private field near Edmonton from which to fly a few passengers and the occasional bag of mail to the town of Peace River. In January 1920, the first airport at Edmonton, "Blatchford Field", was opened, and in the following year May and his partner Horner organized the first commercial flying operations out of that city.

The discovery of crude oil at Fort Norman on the Mackenzie river in the Northwest Territories in the Fall of 1921 led to the first large scale attempt by commercial interests to establish air transportation in the far north. From this time, the aeroplane came into its own as a means of transportation for men and supplies over the vast reaches of the Canadian northland. Prospectors, traders, engineers and others, long dependent upon the canoe and the dog team as means of travel over the trackless regions, made full use of this new and revolutionary machine.

Some idea of the extent of flying operations in Canada at this time may be gained from the figures which appeared in the Canada Year Book of 1921. In December of that year there were 52 certificated private air pilots and 61 certificated commercial air pilots, as well as 109 certificated aircraft in Canada. A total of 1,209 flights were made during the year from the civil government air stations at Vancouver, High River, Alta., Victoria Beach, Man., Sioux Lookout, Ont., Ottawa, Roberval, Que., and Halifax. These flights covered 185,480 miles and were made on behalf of various departments of the federal and provincial governments. The strength of the Canadian Air Force at the same time was 54 officers and 239 airmen, although 505 officers and 1,166 airmen had been trained.

In 1922 the Air Board was merged with the Department of Militia and Defence and the Department of Naval Service into one department known as the Department of National

Defence. Its functions included control of all civil and military aviation throughout the country, including the conduct of flying operations for civil branches of the government service.

Meanwhile, the work of organizing forestry patrol services throughout the country was continued. By 1922 such services were established in British Columbia, Alberta, Manitoba, Ontario, and Quebec, while some 480,000 square miles of Canadian territory had been surveyed by air. In 1923 Ontario became the first province to establish its own forestry air patrols and the federal government withdrew its services.

By this time the "barn-storming" activities of many wartime flyers had come to an end, and those remaining in the field were pilots who foresaw a great future in commercial flying. It is interesting to note that the number of licensed aircraft in 1922 was 89, a decrease of about 20 per cent from the previous year. At the same time there were 24 firms operating a total of 60 commercial aircraft. The remaining 29 were aeroplanes operated by provincial governments. The number of passengers carried was 4,282 while commercial firms handled 14,681 pounds of freight.

The first air service for the regular conveyance of passengers, mail and freight was begun in 1924. The Laurentide Air Service started to fly aircraft on a definite schedule from Haileybury on the Temiskaming and Northern Ontario Railway and Angliers on the Canadian Pacific to the new Rouyn gold fields in Quebec. Before the year was out a total of 1,004 passengers, 78,000 pounds of freight and 15,000 letters and telegrams had been carried by the airline.

The inauguration of this first service to Rouyn led to the rapid expansion of air services throughout the north. The adaptability of the aeroplane to the needs of the mining engineer and the prospector soon brought about almost universal use of aircraft both winter and summer. The flying

boat was largely replaced by aeroplanes fitted with pontoons (floats) for landing on water in summer, and skis for winter landings on the ice.

The period 1926 to 1930 was one of continual expansion and growth of air services. While the northern or "bush" traffic was increasing by leaps and bounds, preliminary surveys and experimental flights were being made over proposed air-mail routes. In 1927 the first inter-city airmail delivery was made in Canada when an aircraft carrying a cargo of mail flew from Ottawa to London, Ontario, on November 25th. In the same year an airmail service was established between Rimouski and Montreal.

To encourage public interest in flying and to increase the general knowledge of aviation, the government in 1927 authorized by order-in-council the establishment of flying clubs and the creation of the Canadian Flying Clubs Association. At the same time a reorganization of the air services in the Department of National Defence took place. The increasing importance of civil aviation led to the establishment of an organization separate from that of the military Air Force. It was to be known as the Controller of Civil Aviation Branch and was to have authority over the licensing of aircraft, personnel, and airports, the survey of air routes, and the administration of Air Regulations. In addition, there was to be a Directorate of Civil Government Air Operations, responsible for the flying operations of civil branches of the government service; an Aeronautical Engineering Branch; and finally the Royal Canadian Air Force, concerned with all aspects of military aviation. All of these branches, however, remained under the Department of National Defence.

Meanwhile, commercial flying was making rapid progress throughout the west. Such flyers as "Punch" Dickins, "Wop" May, Vic Horner, and Cy Becker were blazing new trails across western and northern skies into regions never before visited by white men. In 1928 Becker, Horner, and May organized Commercial Airways, and this company flew the first mail from Edmonton to Aklavik, N.W.T., in the

following year. In 1929 the company became part of Western Canada Airways, which, in turn, was amalgamated with Canadian Airways in 1930.

In 1928 Dickins flew the members of the MacAlpin Expedition from Winnipeg to the west coast of Hudson Bay, thence five hundred miles across barren wastes to the shores of Lake Athabasca. The region was unmapped, and with no radio, the great danger for flyers was to be forced down. Until this epic flight much of the area had never before been seen by a white man.

The imagination of the whole continent was stirred in 1929 when late in January an epidemic of diphtheria broke out at the remote settlement of Fort Vermilion, some four hundred miles north of Edmonton. An urgent appeal was made to rush anti-toxin serum to the tiny settlement. The serum was immediately available from the provincial Department of Health, but transportation was a difficult problem in winter weather. "Wop" May and Vic Horner volunteered to make the trip by air in spite of adverse flying weather. They succeeded, and the epidemic was checked in its early stages. Thus began a long series of "mercy flights" by Canadian flyers into the far reaches of the north. With every passing year an increasing number of victims of accident or illness owed their lives to flyers who braved the rigours of the North in order to "fly them out" for treatment and hospital care.

In 1927 the Canadian government decided to participate in the development of airships for trans-oceanic and long distance air transport. In this connection two airship experts visited the country in the following year to assist in the selection of a suitable air base in eastern Canada. Acting on their advice, the government purchased a large tract of land at St. Hubert Station on the south shore of the St. Lawrence opposite Montreal, for the purpose of creating there a public air terminal for both airships and aeroplanes.

Work on the project began at once, with plans calling for a mooring tower for airships; an aerodrome; and immigration,

customs, and postal facilities. At the same time a terminal aerodrome was under construction at Rimouski, Quebec, for the dispatch and reception of trans-Atlantic mails by air.

In the summer of 1928 surveys were undertaken across the prairie section of the country as the first step in the development of a Trans-Canada airway, and the construction of aerodromes and lighting facilities followed. By the end of 1929, a chain of lighted aerodromes had been prepared from Winnipeg to Edmonton via Regina and Calgary, and a contract for the carriage of mail had been let to Canadian Airways by the Post Office Department. Actual flying operations over the route began on March 1, 1930, with a nightly service each way. This necessitated emergency landing fields, beacons, and such radio equipment as was then available. A similar service was established between Windsor, Toronto, and Montreal, but owing to economic reasons, all operations were suspended on the Trans-Canada airway early in 1932. At this time there were ten commercial air transport companies operating fifteen air mail services throughout the country under Post Office contracts.

Most of the aircraft in use at this time were single-engined machines, such as the Fairchild 71 and the Fokker Super-Universal. They were very dependable, however, and stood up well to the rigorous conditions that prevailed. By modern standards the aeroplanes were small. The Fokker, for example, weighed 5,500 pounds and was equipped with a 400 horsepower motor. It carried six passengers and cruised at one hundred miles per hour. Fuel was carried for four and a half hours' flying and was consumed at a rate of sixteen to eighteen gallons per hour. There were few instruments to aid in navigation in any of the machines, with the result that much depended upon the skill of the individual pilot.

The various governments continued to make extensive use of the aeroplane as a means of protecting the forests. The Manitoba Government Air Service was organized in 1932 and was soon operating five aircraft on forest protection in the province. A total of 882 hours was flown on forest patrol in

Manitoba that year, while in Ontario the figure reached 9,968 hours. In Quebec and British Columbia forest patrol was undertaken by commercial aircraft operators under contract with the government.

At the same time public interest in flying was on the increase. The practice of the federal government of issuing two light aeroplanes to each flying club created much enthusiasm and activity among potential flyers. In 1932 clubs were to be found in the following localities: Halifax and Cape Breton in Nova Scotia; Saint John, New Brunswick; Granby, Montreal, and McGill University in Quebec; Brant and Norfolk, Fort William, Hamilton, Kingston, London, Ottawa, St. Catharines, Toronto, Windsor, and Kitchener in Ontario; Brandon and Winnipeg in Manitoba; Moose Jaw, Regina and Saskatoon in Saskatchewan; Calgary and Edmonton, Alberta; and Vancouver and Victoria in British Columbia.

At the invitation of the government of Newfoundland, representatives of the Canadian government visited St. John's, Newfoundland, in July 1933 for a conference on trans-Atlantic flying. An agreement for co-operation in the establishment of a trans-Atlantic air service was reached by the governments of Canada, the United Kingdom, the Irish Free State, and Newfoundland, in December 1935. The United States government was then consulted and a further agreement reached on the setting up of a mail, passenger, and express service. Trial flights were made by Imperial Airways and Pan-American Airways over the route in 1937. From this time Canada was to play an increasingly important role in the field of international aviation.

With the growth of both military and civil aviation, their administration by one department of government became less convenient as time passed. In the autumn of 1936 civil and military flying were completely separated, the former being transferred to the new Department of Transport, which was also charged with the administration of railways, shipping and highway services. Military flying, of course, remained under the control of the Department of National Defence. One of

the first tasks of the new Department of Transport was the provision of an adequate transcontinental air system for Canada. This involved construction of aerodromes, runways, airport buildings, radio range stations and complete servicing facilities. Progress on the huge undertaking was slow owing to the rugged terrain involved in the building of aerodromes, and it was some years before the Trans-Canada airway was completed.

The use of aircraft for police work in Canada began in 1932 when the Royal Canadian Mounted Police took over the duties of the Preventive Service. In 1937, the R.C.M.P. purchased four twin-engined DeHavilland Dragonfly land planes and placed them in service on the Atlantic seaboard. The aircraft were based at Moncton, N.B., and flying operations began on July 9. A total of 117 patrols were made during the season which ended on October 31, and a total of 350 hours of flying time was logged by the pilots.

The activity in mining during this period was in large measure responsible for the rapid growth of air transportation of freight. In fact, much of the freight carried by aircraft in Canada consisted of machinery and supplies for mines in the northern parts of Quebec, Ontario, the western provinces, and in the Northwest Territories. Many of the mines were accessible only by canoe or dog team, and the aeroplane was soon regarded as the cheapest and most effective means of transportation. The amount of freight carried by aircraft grew rapidly. In 1931 a total of 2,372,000 pounds of freight was transported by air. This figure had increased to a record of 24,317,000 pounds in 1937. This amount was far greater than was carried by any other country. The United States, for example, in 1939 reported a total of 9,514,000 pounds.

As indicated above, flying operations over the Trans-Canada airway were suspended early in 1932 in the interests of economy. Surveys were continued, however, in the western mountain region, and in northern Ontario, Quebec, and the Maritime Provinces, with a view to the eventual

completion of the airway from coast to coast. Aerodrome construction camps were established in all of these regions and much valuable work was done until June 1936 when the camps were closed. Some work was continued, however, under contract or by day labour.

In 1937 Parliament passed an Act creating the Trans-Canada Air Lines as an operating company on the Trans-Canada airway. A survey in the summer of that year revealed that the increase in landing speed and the introduction of night and all-weather flying necessitated larger airports with longer runways and improved surfaces. Facilities that were adequate five years before no longer sufficed. The construction and installation of the necessary radio range stations, five of which were already in operation, the enlargement of airports and the installation of lighting systems, were undertaken in September 1937 with a view to completing the airway from coast to coast as early as possible. In the meantime, the Trans-Canada Air Lines were organizing and training their flying and ground crews, purchasing aircraft and building hangars and workshops that were necessary to the successful operation of the air line.

On January 1, 1938, experimental flights were made in daylight over the route between Vancouver and Winnipeg. The success of these first flights led to the establishment of an experimental airmail service between these two centres on March 4, 1938. By October 1, the erection of radio stations and workshops, the installation of teletype, two-way wireless, and meteorological service, the enlargement of airports and the lighting of the route for night operations were completed and a regular airmail service between Vancouver and Winnipeg was inaugurated on that date. The northern connection to Edmonton from Lethbridge was also made at the same time, although no stop was made at Calgary until the new and larger airport was completed.

Meanwhile, the erection of wireless stations between Winnipeg and Montreal was progressing rapidly. As soon as weather conditions in northern Ontario were favourable,

work on the airports and lighting facilities was taken in hand. At the same time delivery of the ten "Lockheed 14" aircraft which had been purchased for use on the main route was completed early in September, and regular daily flights on schedule were commenced on September 10 for the training of flying and ground personnel over the Winnipeg-Montreal section. On October 17 an express service between Montreal, Toronto and Vancouver was begun. The need for additional radio range stations was made apparent by these early flights and four additional stations were constructed in 1939.

Such progress had been made in the development of the airway from coast to coast that in January 1939 there were some 83 airports completed or under construction across the country. These made up the main line service from Moncton, N.B. to Vancouver, B.C. Eighteen of the airports were primary fields, eighteen were secondary fields, while the remainder were emergency landing fields. In addition, there were thirty radio range stations situated at about one hundred mile intervals except through the mountains where they were much closer together. Adjacent to most of these stations was a fully-lighted airport complete with meteorological equipment which was used to supply information on weather to planes in flight and to the central forecasting stations at Vancouver, Lethbridge, Edmonton, Winnipeg, Kapuskasing, Toronto, and Montreal. Weather maps were prepared at these stations four times each day and district forecasts were issued for the ensuing six hours.

Construction on the airway was also pushed with vigour. A major airport was completed at Moncton, N.B. in the autumn of 1939, while an intermediate field and range station were built at Blissville, N.B. Major improvements were also made on the airfield at Megantic, Quebec, so as to accommodate the faster and larger aircraft now in use. Intermediate airfields were constructed at Havelock, N.B. and Windsor Mills, Que., while municipal airports at Halifax and Saint John were enlarged and improved so as to provide facilities for connecting lines to Moncton. A new airport

was also built at Charlottetown, P.E.I., together with a radio range station to aid in all-weather flying to and from the Island.

On November 1, 1939, the Trans-Canada Air Lines commenced a mail service between Montreal and Moncton. Three months later, passenger, mail and express services were in full operation over this route, thus completing the last link in the transcontinental service.

Extensions of the Trans-Canada services were operated by Canadian Airways Limited between Vancouver and Victoria, also between the eastern terminal at Moncton and Saint John, Halifax, and Charlottetown.

Meanwhile, the Department of Transport had made provision for the construction or improvement of airports by municipalities. By 1939, a total of thirty-two cities had taken advantage of this opportunity, including most of the larger centres of population. Some idea of the growth of commercial aviation in Canada is given by the fact that in 1939 there were sixty-two licensed air services operating throughout the country. Some of these were inter-urban, but the majority were air services operating throughout the vast reaches of the Canadian North.

The outbreak of war in September 1939 had a profound effect upon the development of aviation in Canada. In October of that year announcement was made of the British Commonwealth Air Training Plan with Canada as the base of operations. The original plans called for the establishment of sixty-four flying training schools and the construction of numerous aerodromes. All existing facilities, developed in connection with the Trans-Canada airway, were pressed into service, while flying clubs across the country were called upon to undertake the formation of Elementary Flying Training Schools and to provide much of the primary training for students under the Air Training Plan. Private commercial aviation companies undertook to organize schools for both elementary and advanced training in flying, while larger companies undertook the task of giving instruction in

elementary navigation and of operating Air Observer Schools. Civil aviation thus supplemented the work of the Royal Canadian Air Force in the operation of the vast Plan with outstanding success.

For some time plans had been under discussion for an airway that would give access to all parts of northwestern Canada and Alaska. In 1935 a survey was made by the Department of Transport to find the best route from Edmonton to Yukon and Alaska. Engineering work was authorized in 1939 and aerodromes were planned at Grande Prairie, Fort St. John, Fort Nelson, Watson Lake, and Whitehorse. Landing strips, 3,000 feet in length by 500 in width were constructed, along with radio range stations at intervals of one hundred miles along the route. By September 1941 the airway, known as the Northwest Staging Route, was completed to the point where it was usable by daylight in good weather from Edmonton to Whitehorse, Yukon Territory. Radio range stations were in operation at two hundred mile intervals from Edmonton to the Alaska boundary by the end of the year. The entry of the United States into the war in December 1941 brought about the need for a rapid expansion of facilities. Aerodromes had to be enlarged to handle the heavy volume of traffic, longer runways were needed to cope with the larger and faster planes, while radio range stations were expanded as well. By July 1943 the Canadian government had virtually completed its programme of construction on the Route which played a vital role in the movement of traffic to the Far East for the remaining years of the war.

Meanwhile, action was taken in 1941 to provide facilities for the rapid ferrying of short-range aircraft from Canada to the United Kingdom through the development of a North-east Staging Route. In that year surveys were made at Goose Bay in Labrador for the construction of a large aerodrome which would be able to accommodate any type of plane making the flight to Europe via Greenland and Iceland. With the permission of the government of Newfoundland, Canada undertook to construct the field on the agreement with

the governments of the United Kingdom and Newfoundland that Canada would be given a ninety-nine year lease on the Goose Bay Air Base for defence purposes dated from September 1, 1941.

When the United States entered the war an increasing strain was placed on the facilities of the Northeast Staging Route and action was taken in June, 1942 to provide facilities for ferrying long-range aircraft from the United States to The Pas and Churchill, Manitoba, thence to Southampton Island, N.W.T., Frobisher Bay, Baffin Island, Greenland, and Iceland, and from there to their destination. Aerodromes were developed at The Pas, Churchill, and Southampton Island, together with the necessary radio range equipment along the route, and this new "Crimson Route" was used extensively by both Canada and the United States during the rest of the conflict.

An important event in the field of civil aviation took place in 1942 when the Canadian Pacific Air Lines was formed through the amalgamation of ten independently operated "bush" lines. These were Canadian Airways with headquarters in Winnipeg; Yukon Southern Air Transport with main offices at Vancouver and Edmonton; Quebec Airways of Montreal; Dominion Skyways, also of Montreal; Arrow Airways, The Pas, Man.; Prairie Airways, Moose Jaw, Sask.; Ginger Coote Airways, Vancouver; Wings Limited, Winnipeg; Starrat Airways of Hudson, Ont.; and Mackenzie Air Service, with head office in Edmonton.

While at first much of the business of the Canadian Pacific Air Lines was associated with the war effort, "bush" service was maintained in all important regions in the search for essential war minerals extended over ever-increasing areas. Newer and larger types of aircraft were also acquired and improvements made to aerodromes, radio ranges and navigation facilities, so as to permit all-weather day and night operations over most routes. Some idea of the scope of the new Canadian Pacific Air Lines is gained from the fact that

in the first year of operations some sixty thousand passengers and ten million pounds of freight, express, and mail were carried.

Meanwhile, the Trans-Canada Air Lines continued to expand its services. In 1943 Trans-Canada extended its western route from Vancouver to Victoria. At the same time a third daily flight from Montreal to Winnipeg was added to the schedule. Routes in operation totalled 4,903 miles, made up as follows: St. John's, Nfld. to Victoria, B.C., 3,911 miles; Halifax to Moncton, 120 miles; Toronto to London and Windsor, 206 miles; Lethbridge to Calgary and Edmonton 301 miles; and finally, an international route, Toronto to New York, 365 miles.

A major event of 1943 was the establishment of a Canadian Government Trans-Atlantic Air Service with equipment and personnel furnished by the Trans-Canada Air Lines. While this was a wartime measure, it was to be expanded and developed considerably by T.C.A. upon the return of peace.

The end of the war in 1945 created vast problems for civil aviation. Immediate steps were taken to dismantle whole sections of the huge structure that was developed for war purposes. Airports, airways, communication systems, and other facilities were turned over to civil administration as fast as circumstances would permit.

One hundred airports were declared surplus to Royal Canadian Air Force requirements in 1945 and these were turned over to the Department of Transport. If, after investigation, it appeared that an airport had no continuing value for civil aviation purposes, the property was turned over to the War Assets Corporation for disposal. Sixty-two of the surplus airports were retained and thirty-eight were turned over to War Assets Corporation in due course.

Facilities constructed in Canada by the United States along the "Crimson Route" and from Edmonton to Fort Norman were purchased by Canada and turned over to the Department of Transport for administration and operation or if desired, for disposal.

Commercial flying, which had been held to a minimum consistent with the national interest during the war, expanded rapidly with the return of peace. Civil operators immediately turned their attention to the purchase of much needed flying equipment and the hiring of personnel to meet the increasing public demand for more flying. In 1945, operating certificates were issued by the Department of Transport to twenty new independent air lines established in most cases by returning air force personnel.

Aside from the Trans-Canada Air Lines and the Canadian Pacific Air Lines, there were four domestic air lines in 1946 that were licensed to operate scheduled services in Canada. They were the Maritime Central Airways of Charlottetown, P.E.I.; Northern Airways Limited, Carcross, Y.T.; Levens Brothers Air Services Ltd., Toronto, Ont.; and M. and C. Aviation Co. Ltd., Prince Albert, Sask.

Most of the independent air lines, however, operated on non-scheduled services which, with few exceptions, were charter services from designated bases. In fact, at the close of 1946, operating certificates issued by the Department of Transport included over seventy non-scheduled commercial charter services throughout the country.

Both Trans-Canada Air Lines and Canadian Pacific Air Lines undertook substantial programmes of expansion and development when the war ended. In 1946, for example, T.C.A. took delivery of twenty-four DC-3 aircraft which were used to replace the smaller Lockheed aircraft then in service. At the same time, Canadian Pacific Air Lines acquired ten Douglas C-47's, nine Norsemen, and four Cansos, replacing older types of plane that were used during the war.

Some idea of the extent of the operations of the two major Canadian air lines is seen in the fact that in 1946, Trans-Canada Air Lines carried 305,442 passengers and 1,043,713 pounds of express, while Canadian Pacific Air Lines transported 175,461 passengers and 16,514,741 pounds of freight.

In 1947 scheduled operations were begun by T.C.A. on the Great Lakes air route, which was to save 125 miles on the flight from Toronto to Winnipeg. The route across Northern Ontario thus became an alternative to this new Great Lakes air route. Airports and radio range stations were built at Wiarton, Ontario and at Gore Bay on Manitoulin Island. Intermediate airports and radio ranges were also constructed at Grand Marais and Houghton, Michigan by the State of Michigan with funds supplied by Canada.

This new Great Lakes route put Fort William and Port Arthur on the new Trans-Canada airway. From the lake-head cities the route goes to Graham, Ont., where a radio range was installed, and thence to Kenora, Ont., where it joined the original Trans-Canada airway.

The Great Lakes route along the south shore of Lake Superior was planned in co-operation with the United States and the authorities of the State of Michigan. It was chosen because the cold and rocky north shore in Canada prohibited the construction of suitable intermediate airports, while a direct flight from Sault Ste. Marie, Ont., to the head of the Lakes involved a trip of more than 250 miles over water.

On May 1, 1947, Trans-Canada Air Lines assumed responsibility for the operation of the Canadian Government Trans-Atlantic Air Service. This action placed the operation on a full commercial basis in competition with other commercial air lines over the trans-Atlantic route.

Meanwhile, test flights had been made of the new North Star aircraft in July, 1946. This plane, which was equipped with four engines and could carry forty passengers, was largely a Canadian design based on the original American DC-4. In April 1947, a North Star was used for the first time on the trans-Atlantic route, and before long these aircraft were being used exclusively on the trans-Atlantic service. Early in 1948 they made their appearance on the Toronto-New York run and came into use on domestic transcontinental flights in June of that year. On May 1, 1948, the Trans-Canada Air Lines inaugurated a service to Bermuda with flights from Montreal and Toronto each week. North Star

aircraft were placed in service on this run as well. In the following year the service was extended to Trinidad and the Barbados.

A major development took place in 1948 when the Canadian government assigned to the Canadian Pacific Air Lines the licence to operate trans-Pacific services between Canada and points in Australia, New Zealand, and the Far East. Orders were immediately placed by C.P.A. for Canadair four-engined aircraft for use on these new routes.

Service between Vancouver and Australia and New Zealand began in July, 1949 while service between Vancouver and the Orient went into operation in September of that year.

An important development in the field of air travel in Canada was the installation of Instrument Landing Systems at main airports. These systems, which facilitate safe landings in adverse weather, were adopted by the International Civil Aviation Organization for international flying, and Canada was one of the leaders in the installation of these modern devices. By 1951 ten major airports were equipped with Instrument Landing Systems and six others were having such equipment installed.

Encouragement was given to flying clubs by the adoption of a new flying training programme in January, 1949. Under the plan, approved flying clubs and schools received federal grants for flying training. In order to qualify for such grants, clubs and schools had to provide flying training that conformed to the course of pilot training approved by the Department of Transport. Student pilots were required to qualify for a Department of Transport private pilot licence in accordance with the agreed international standard set by the International Civil Aviation Association.

Under the flying training plan clubs and schools received \$100 for each individual granted a private pilot licence through the club or school. Each student qualifying for a private pilot licence and receiving a Department of Transport licence got a grant of \$100. Students who qualified for a Department

of Transport private pilot licence could qualify for an additional \$100 on being accepted into the Royal Canadian Air Force—active, reserve or auxiliary forces.

In 1952 the civilian airlines flew to new records. During the year commercial aircraft logged over forty-eight million miles, an increase of about 20 per cent over 1950. They carried 2,368,000 passengers compared to 1,888,000 in the previous year, and set up a new record by moving 141,000,000 pounds of freight. Another record was established when over eighteen million pounds of air mail was carried. This broke by over two million pounds the record set the year before.

In 1951 there were 2,301 licensed civil aircraft in Canada, while there were 1,175 commercial pilots, 612 transport pilots, and 4,444 private pilots holding licences.

With the tremendous development of natural resources and the vast expansion of industry, rapid and efficient transportation has come to play a most important role in the life of the country. Canadian air lines have kept pace with the need for faster planes and more frequent flights, at the same time employing the latest equipment designed to guard the safety of air travellers. Today Canada stands among the leading nations of the world in the field of air travel and transportation.

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Williamsburg Canals.....	35
Yonge Street.....	58, 59, 66, 76
York Boat.....	25
Yukon Territory.....	32

CANADA

(Exclusive of northern regions)

Scale of Miles
100 50 0 100 200 300 400

REFERENCE

- Government Capital
- Provincial Capital
- Railway Main Lines
- Trans-Canada Air Lines
- Other Air Lines



DISTANCES BETWEEN PRINCIPAL POINTS IN CANADA 4

NOTE.—Generally, the distances given are the shortest by railway.

A knowledge of distances in miles between principal points constitutes very useful information in these days of wide travel, but when an attempt is made to compile such data, difficulties are at once encountered. Railway distances are the logical choice, even though road distances are of increasing interest to a vast body of travellers by automobile and are a useful alternative. Railway distances represent usually the shortest practicable land distances between two points and even to-day the bulk of freight and passenger traffic is by rail. Again, distances by air (sometimes called 'beeline' distances) are only useful in practice to those who travel by air. This is a growing phase of transportation, of course, but has not yet assumed such proportions that its tabulation should displace the more usual one. Again, it is not a difficult matter to estimate air-line distances from a map made to convenient scale, whereas the ordinary reader is not able to obtain railway distances easily.

The air-line distances used are not necessarily the straight-line distances between points, but are the distances over the routes usually travelled by aeroplanes in good weather.

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*Prepared under the direction of B. W. Waugh, Surveyor General, Department of Mines and Technical Surveys, Ottawa.

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